Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

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Rail-Road News.

Hudson River Railroad.

The Troy Post gives the annexed statement of the arrangement between the Hudson River and the Troy and Greenbush Roads:

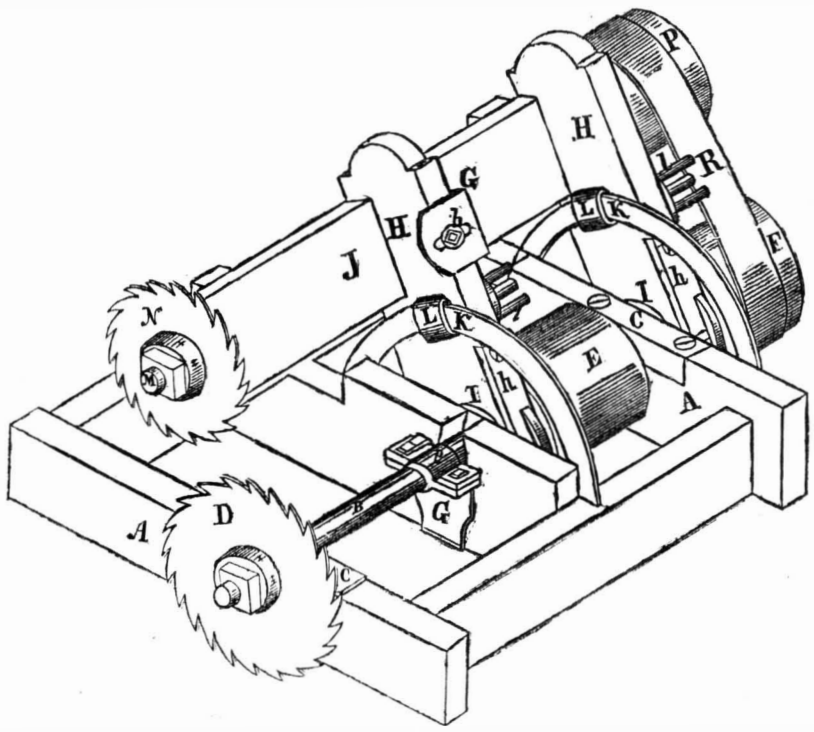
"The Hudson River Company have obtained a lease of the Troy and Greenbush Railroad, with all its implements and fixtures, for the term of its charter—thirty years—and for all future renewals, paying for the same seven per cent. annually, on $275,000—payments to be semi-annually. The lease requires of the Hudson River Company that they shall run all their through trains directly to and from Troy, thus making this the northern terminus of their road. They are also required to keep up the local business of the Troy and Greenbush Railroad, running the cars, as now, for local accommodation and for transportation. We are informed that the Hudson River Company will, immediately after coming into possession of the Troy and Greenbush Railroad, construct a double track, straightening the same so as to lessen the distance, and putting down a new and heavier rail than is now used. Some $150,000 will be expended for this object the ensuing summer; it is expected that the work will be completed, a new track or tracks constructed through the city—everything in order—sometime during the ensuing Fall. The Hudson River Railroad will be completed between Hudson and Greenbush in May next, when trains will be run direct from Troy to Hudson, and in September the whole line will be finished, and the cars running from Troy to New York."

Railroad Across Florida.

The New Orleans Picayune of the 18th inst., publishes a letter from Governor Brown, of Florida, relative to the above named road, and urging its construction upon the favorable regard of the citizens of New Orleans. He says respecting the project:—"I cannot imagine an enterprise in which the people of New Orleans should take a deeper interest. Connected with the contemplated route from the southwestern coast of the Gulf of Mexico, across the Isthmus of Tehuantepec to the Pacific ocean, it completes the entire line of steam transportation from the extreme Northern States on the Atlantic to the Pacific, passing directly through the city of New Orleans. A glance at the map must impress the mind with the importance of this link between the Atlantic and the Gulf, through Florida, in the great chain connecting the two oceans."

The style of the proposed road is the "Florida, Atlantic, and Gulf Central Railroad," and its charter has no restrictions as regards the termini, which may be located at the most suitable points on the Atlantic and on the Gulf side. This railroad will become one of the most important in the whole of our continent.

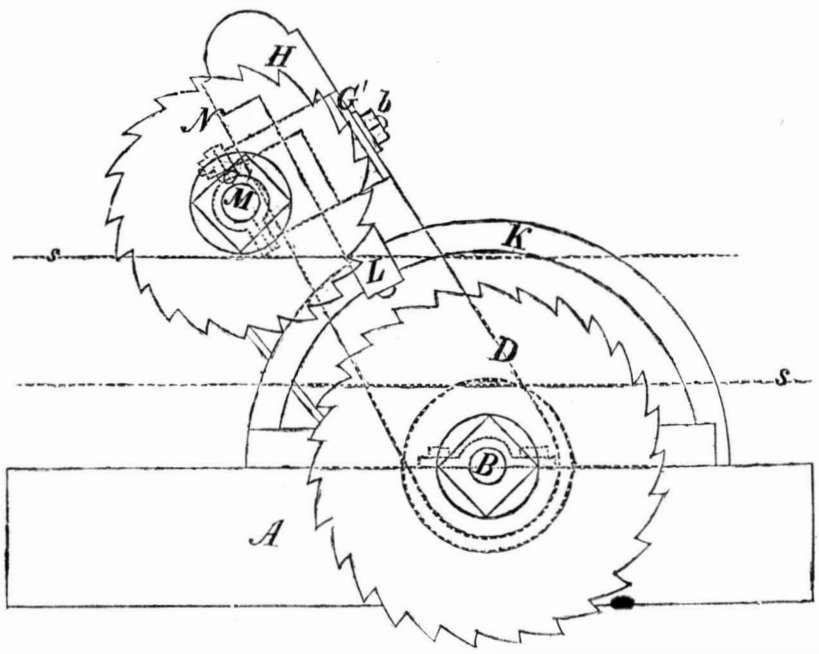
IMPROVEMENTS IN MACHINERY FOR SAWING TIMBER.---Figure 1.



This is an improvement on machinery for sawing timber, invented by Mr. Orlando Child, of Granville, Putnam Co., Ohio, and for which a patent was granted on the 17th of last December, the claim of which was published on page 118 of the Scientific American.

Figure 1 is a perspective view taken at the back of the saws; figure 2 is a side elevation. The same letters refer to like parts. The principles of the invention embrace two prominent features. One is a strong spring attached to the frame, the object of which is to prevent the end play of the saw shaft without using collars, and at the same time will yield to the pressure on the sides of the saw occasioned by the springing of the log, and thus prevent the heating of the saw by the pressure of the log, which pressure sometimes destroys the saw. The second feature is the application of an additional saw, having its spindle working in bearings attached to swinging arms capable of being adjusted and secured at any point in a line forming part of a circle to be set in different positions, so as to assist in sawing through the same log with the larger saw, and it also can be set so as both saws can act, and two separate boards be cut up out of the same log at once. A A is part of the frame of a saw-mill; B is the stationary saw spindle; C C are the bearings; D is the saw

Figure 2.



secured on the spindle; E is the driving pulley; F is another pulley keyed on the same shaft; G is a strong spring of flat steel secured at its lower end to the frame, A. On its upper end there is a journal box *q* (letter turned wrong way by engraver), fitting to the spindle, B.

H H are swinging arms attached by metal straps, *h h*, to circular bosses, I I, provided with flanges to prevent the swinging arms from slipping off. The bosses, I I, are hollow, to allow the spindle, B, to pass through them, and are concentric with the said spindle; the arms, H H, fit on the said bosses so as to allow of their being easily swung in any required direction. J is a plank or table secured across the front of the arms, H H. K K are arches formed of flat bar iron attached at each end to the frame, A. L L are bolts having their heads formed so as to embrace the arches, K K, these bolts pass through the arms, H H, and are provided with nuts, *l l*, for the purpose of securing the arms, H H, to the arches, K K, and holding them in any required position. M is a spindle carrying a saw, N, and rotating in bearings bolted to the front of the plank or table, J. P is a drum or pulley fast on the spindle, M. R is a driving band for communicating motion from the spindle B to the spindle M. G′ is a spring attached to one of the arms, H, it is forked, each end of the fork passes through a slot in the plank or table, J, and is attached to a journal box, which fits to a journal turned in the spindle, M; its effect on this spindle is precisely similar to that of the spring, G, on the spindle, B; the spring, G′, is attached to the arm, H, by a screw bolt, *b*, passing through a slot in the spring into the back of the arm, by which it may be adjusted; the spindle, M, passing freely through, may be moved in the direction of its length so as to set the saw, N, in or out of line with the saw, D, as represented by strong dotted lines, S S, in fig. 2. The operation is as follows:—if it is required to cut a log, which would be too large for the saw, D, to cut through, the arms, H H, are raised to about the position represented in figure 2, the lower part of the periphery of the saw, N, being set rather lower than the upper part of the periphery of the saw, D, and is secured in such position by the bolt and nut, L *l*, when it is ready for operation.

If it is required to make two cuts in a smaller log, the arms, H H, are secured in the position shown by lines in figure 2, bringing the saw, N, almost on a level with the saw, D; the spindle, M, is moved in the direction of its length, so as to set the saw, N, the required distance in the required direction, right or left of the saw, D. The saw, N, may also, if required, be moved to a vertical position clear of the log. Rotary motion being communicated by a band to the pulley, E, or by other convenient means to the shaft, B, is transmitted by the band, R, to the drum or pulley, P, on the spindle, M, causing both saws to rotate in the same direction.

The advantage of using two small saws, in place of one large one, for cutting thick lumber, is not only in the very great saving in the cost of the saws, but also in the economy of working; the small saws being thinner will cut away less timber and run proportionately lighter and at less expense of power.

In using circular saws, the lateral springing of the timber is found in many cases to press so heavily on the sides of the saw as to cause great friction, and heat the saw to such a degree as to injure it; this will be obviated by guiding the saw by means of the spring, G, and its journal box, the spring being of sufficient strength, to prevent end play of the spindle, but at the same time yielding to the lateral pressure, caused by the springing of the log, will cause the saw to run lighter, will make less noise, and will make a cleaner cut.

More information may be obtained by letter addressed to Mr. Child.

The Duke of Wellington once left his umbrella by accident, on the stall of a lady of rank, at a fair. On returning to look for it, he was told that the umbrella had just been sold for twenty-five guineas by the lady, who could not resist the temptation of disposing of so valuable a relic, for charitable purposes.

Large Balloon.

John Wise, Esq., of Lancaster, Pa., is engaged in constructing another monster balloon, to be about three times as large as the "Hercules," used last summer, with which he intends to prove the certainty of his ability to cross the Atlantic and circumnavigate the globe.

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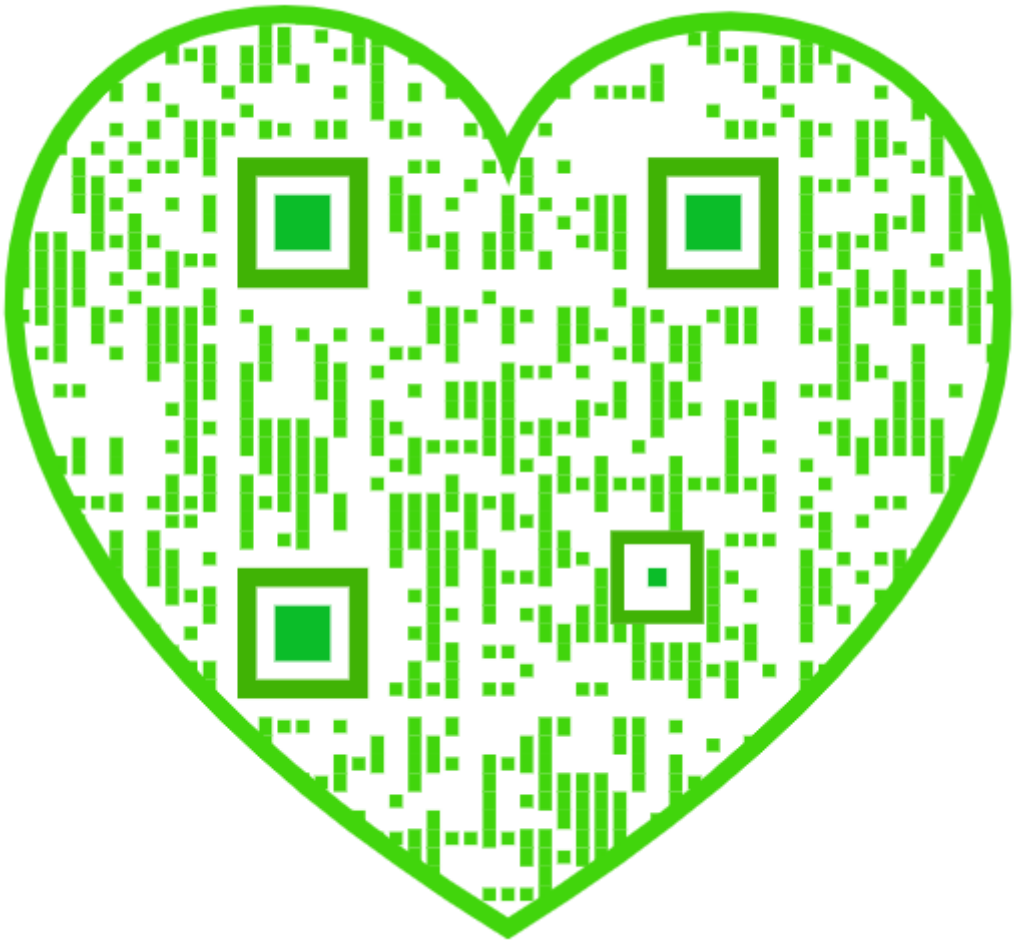

Miscellaneous.

Foreign Correspondence.

LONDON, 20th Feb., 1851.

Various quaint and strange projects are being brought forward to attract attention, with the ultimate object in view of making the *honest* penny out of visitors to the World's Fair. Among other things to be exhibited, *outside*, will be an immense globe by a Mr. Wyld. It is to be located in Leicester Square, in a building fitted for the purpose—the ground having cost the beautiful little sum of $15,000 as a rental merely. The building for it is to be of a circular form, 90 feet across, enclosing the globe of 60 feet in diameter. Corridors for promenade will surround it, and it is to have four covered approaches from the sides of the square. The external elevation at the sides is proposed to be 20 feet high, surmounted by a large bell-shaped roof of zinc. The building itself will be mainly of timber, the inner surface of the globe of plaster of Paris. In the centre of the globe will be a series of galleries, four in number, constructed so as to enable visitors to see every proportion of the model. These galleries, it is said, will afford accommodation for 1,000 or 1,500 persons at one time, and are to be approached by spiral staircases in the centre.

A most wonderful piece of linen has been woven for the Exhibition, in the North of Ireland, near Waringstown, by a weaver named Geo. Haddock. It is a web of fine cambric handkerchiefs. Small print can be read through it, and yet the web is so close and compact that a single thread could not be distinguished without the aid of a microscope, or rather web-glass. The cambric, when held up to the light it looks like a fine and airy fabric. In the production of this beautiful gossamer-looking cambric, Mr. Haddock almost realised what classic fiction ascribed to the performance of Arachine, who, as mythologists inform us, was converted into a spider, on account of equalling that ingenious little architect in her production of fine webs.

A rival has appeared to the file described in my last, by a Danish manufacturer. It is a large flat file with four sides of equal breath, and weighing 10 lbs., ornamented externally with the royal arms of Denmark and views of public edifices of the city of Copenhagen, cut with hammer and chisel after the manner of the great Sheffield file just completed by Hiram Younge. But what enhances the curiosity of this Danish file is the fact of its being hollow and containing a nest of smaller files within its iron sides. In the first place you draw out a large round file, which, in its turn, disgorges several others, all of them hollow and acting as depositories of other files still smaller. There are about a dozen, all embowelled within the parent "rubber," the smallest of the tubular files being an inch and a quarter long. The ingenious fabricator is Mr. J. W. Naylor, a file manufacturer at Copenhagen, the place of his nativity. His father, who died last November, was a Birmingham file-smith, who adopted that city as his place of residence many years ago. The file is got up expressly for the great Exhibition.

A very unique case of cutlery, by a Sheffield house, has also been brought into notice. There are 40 pieces of cutlery, knives and forks and spring knives, made from the solid, and ivory-hafted. The smallest pair is under three-eighths of an inch over-all (from the extreme of the haft to the point of the blade), and can be put into the tube of an ordinary tobacco pipe. The sizes increase gradually up to four inches over all. All these have been made by a Mr. Oliver, some of them 20 years back, and have cost an amount of labor and perseverance inconceivable to any but those acquainted with the minutiæ of such an undertaking. On the right-hand side of the miniature case is a specimen of the knives and forks manufactured 100 years ago—a green ivory China headed round point knife, and spoon shank fork. Antiquated articles they certainly are, and, as compared with the cutlery manufactured at this time, look woefully shabby. On the left-hand side is a specimen of table cutlery manufactured fifty years ago—the knife round-point, and fork straight prong, turned bolsters, and silver pistol-hafted. This was the style in 1800. The top part of the case is occupied by some choice specimens of carving knives in the newest design The first is a set of game carvers, knife, fork, and steel, in fawn's feet, mounted and shod in silver. The fork is a diamond-cut shank and scope prongs. Above these is a magnificent pair of venison carvers set in elephant's tusks, the smallest ever known to have been imported into Sheffield. The tusks are respectively 8, 9, and 10 inches in length. The blade of the carver is 16 inches in length. In the centre of the blade, in gold letters, is the word "venison," enclosed in scroll work.

During the week an immense quantity of goods, chiefly from abroad, has been deposited in the building at Hyde Park, and the arrangements made for the reception, examination, and classification of the goods appear, up to this time, to work extremely well. A great portion of the time of the Executive Committee is necessarily occupied in receiving visitors and answering applications and inquiries, but no fears are now entertained as to the ultimate completion and fitting of the entire building at the time originally specified. The painting of the iron-work externally and internally is very far advanced, and a few days more of the present dry and open weather will see this portion of the work finished. The row of trees standing in this part of the building rises considerably above the level of the glass roof, and the green buds which the late genial weather has somewhat permaturely brought forth, have a curious effect, springing from the glassy bed in which they appear to be growing. At this end of the building facing the Serpentine an entrance is now being made for the use of the refreshment contractors and their assistants, whose labors will be carried on siumltaneously with, but quite apart and separated from the getting up of the objects intended for exhibition. The foundation of a large police station is being laid on the south side, on the left of the entrance gates. This will be merely for the temporary detention of evil doers. The present number of police on duty is 50, and these are relieved occasionally during the day and night. A small portion of the iron railing, by which the building is to surrounded, has been put up on the south. It is placed within eight or ten feet of the building, is about four feet high plain and substantial in appearance.

The labors of the Executive Committee will in future proceed rapidly, undisturbed as they will be by the crowds of sight seers and visitors, who kept up a continuous stream during the last two months, and the total, rigid exclusion of all persons from this period to the 1st of May, will merely serve to whet the public appetite, and impart a greater feeling of novelty and interest to the perfected and fully developed Exhibition.

On Saturday afternoon H. R. H. Prince Albert, the Countess de Neuilly (ex-Queen of the French), and the Duke and Duchess de Nemours, and their suit, visited the new building.

EXCELSIOR.

The New York Organ.

We made a mistake last week in stating that Mr. Brognard edited the Organ—he was part proprietor. Mr. C. Hoover is, and has been, the editor for a number of years. Well, we are glad to find our friend Hoover alive; we had forgotten his name, (our memory does not retain a name but with great difficulty), and when we were told "the Editor of the Organ, Mr. Brognard, was dead," we thought it was our friend and acquaintance Hoover, who was a long time our next door neighbor editor.

The Eating, Drinking, and Smoking Tax of Great Britain.

The revenue derived last year by the Government of Great Britain, upon the eating, drinking, and smoking articles alone, amounted to $150,000,000. This statement was made by Mr. Wood, the Chancellor of the Exchequer, in a recent speech, when presenting his yearly budget to Parliament.

Philadelphia Academy of Natural Sciences.

We learn by the Philadelphia North American, something about this respectable Institution. It has now a library of 12,000 volumes and its museum contains a small but valuable collection of quadrupeds, and an extensive series of comparative anatomy. More than 17,000 fossil organic remains; about 5,000 minerals; 12,000 species of insects; 2,500 species of shells; 1,500 species of fishes and reptiles; an in the herbarium there are about 35,000 species of plants arranged according to the natural system. The collection of birds is not excelled, probably, by any in the whole world. In December of 1847, it numbered 23,000 specimens, and since that date many have been added. It includes the celebrated collections of the Duke of Rivoli; of M. Bounier, and Mr. Gould's birds of Australia, the identical specimens from which drawings were made for his splendid work on the subject.

This collection, which is of inestimable value to the students of natural history, is visited by about 5,000 persons every year; and very many scientific men resort to it and the library, from every section of the Union for purposes of study and comparison.

The purpose of the Academy of Natural Sciences of Philadelphia is to obtain and extend information upon every subject pertaining to zoology, botany, geology and mineralogy. Its library and museum are collected for this purpose, and are accessable to all votaries of science, free of cost. The expenses of the institution, which are very considerable, are defrayed by annual contributions from members the increase of the library and museum depends on donations from the scientific. The prosperity of this institution, the result of private efforts exclusively, is one palpable evidence of the love of science, as well as the liberality of scientific men, found in Philadelphia. It contains a collection of birds, and human skulls from every nation and tribe of the earth, which are not surpassed, if equalled, by any others of the kind in any part of the world.

This institution originated in an agreement made by a few gentlemen, in 1812, to meet at their respective residences in town, once a week, for the purpose of receiving and imparting information on subjects connected with natural history At that period the study of natural history was confined, in this country, to a very few zealous individuals; and although several societies had been organized for concentrating the scientific talent and enterprise of Philadelphia, their duration was for the most part ephemeral. About this period, however, natural history received a permanent impulse from the appearance of Wilson's "American Ornithology," and from the personal exertions and published tracts of Dr. Benjamin Smith Barton.

During the early period of the Academy's existence, collections of natural objects and books accumulated slowly, because "money, *primum mobile* of human achivements, was sparingly at the disposal" of the infant institution. But at this period the Academy found in William Maclure, the pioneer in American geological researches, a truly magnificent patron. Besides contributing largely to the museum and library, he gave not less than $20,000 towards the erection of the present hall; and to his munificence, in time of need, the Academy is mainly indebted for its present prosperity. Although they may not perceive the great utility of the institution, Philadelphians should honor the memory of a man whose labors and liberality contributed so much to the scientific facilities and character of their city.

In 1817 the Academy was incorporated. The same year Mr. Maclure was elected its President, and was annually re-elected till his death, in march 1840.

At the present time the academy numbers about two hundred resident members, and more than five hundred correspondents in every part of the globe. It publishes periodically a journal of "Proceedings of the Academy of Natural Sciences of Philadelphia;' and from time to time volumes of Transactions, which embrace most valuable contributions to a knowledge of the natural history of our own country. The Philadelphians may well be proud of this institution.

Borden's Meat Biscuit Factory.

We learn that Mr. Borden is going ahead with the manufacture of his meat biscuit in Galveston, Texas.

An engine of ten horse power, with two cylinder boilers, constitutes the power to drive the machinery, which consists of biscuit machines to knead, roll, and cut the dough—a grist mill to pulverize the biscuit, a fan to raise the fire in a blast furnace for heating the oven, and "the guillotine," to cut the meat into small pieces.

There are four wooden caldrons or tubs for boiling the meat and evaporating the liquid or broth—the two for boiling the meat, holding 2,300 gallons, will each boil 7,000 lbs. of meat in twelve to sixteen hours. The other two for evaporating will contain some 1,400 gallons each. All the tubs are heated or boiled by steam passing through long coiled iron pipes, supplied at pleasure either from the escape steam from the engine or direct from the boiler.

When the meat is so far boiled or macerated that the liquid or broth contains the entire nutriment, the meaty or corporeous portions are separated by a simple process of filtering, so that the broth goes into the evaporator pure and free from fibrous matter. It is then evaporated to a degree of consistence resembling Sugar House Syrup. One pound of this syrup or extract contains the nutriment of some eleven pounds of meat (including its usual proportion of bone) as first put into the caldron. This extract is then mixed with the best and finest flour, kneaded and made into biscuit by means of the machines before mentioned. The biscuit is baked upon pans in an oven so constructed as to produce a uniform firmness. The proportion is as two pounds of extract are to three pounds of flour, but by baking the five pounds of dough is reduced to four pounds of biscuit,—the nutriment of over five pounds of meat in one pound of bread which contains besides, over ten ounces of flour.

The biscuit resembles in appearance a light colored sugar cake. It is packed in air tight casks or tin canisters of different sizes, part of the biscuit being pulverized by grinding in a mill for the purpose, and thus packed with the whole biscuit.

The War Department being impressed with the importance of the new article of diet presented in the meat biscuit, has determined to make a thorough test of it among the troops on the frontier, and has accordingly ordered a large amount for the purpose.

Georgia Cotton Yarns.

The Augusta Republic says:—We noticed a few days ago, a large number of bales of yarn being conveyed by drays to the Steamer Metcalf, to be shipped to New York, Philadelphia and Baltimore, via Savannah. We understand that there were about 400 bales in the lot, manufactured by the mills on the canal, near this city, and intended for northern markets. This fact speaks volumes in favor of the expediency and pecuniary profit of Southern cotton manufacturers. In time, these establishments will not only supply the home demands for yarns and other cotton fabrics, but come into successful competition with Northern articles. The high price of cotton, recently, has had the effect to check investments in cotton manufactures at the South to a certain extent, but we do not doubt their general introduction at an early day throughout the Southern States.

(For the Scientific American.)

Chain Belts.

I noticed an inquiry concerning chain belts in a late number of the Scientific American, and having used chain belts, I have thought it best to give my opinion from my experience with them. Those I used were mostly the imported, with short twisted links. I have now just put one in operation without the twist, which I think operates quite as well, and requires no more power to drive it than a leather belt. They must be used with a lighter, which should play on the running part, and be weighted. The expense is about one half that of leather belts, taking all things into consideration.

JAS. R. SPENCER.

Moodus, Conn.

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The Manufacture of Glass.---No. 2.

As the formation of glass is produced by the simple operation of fusing certain minerals together, it follows that the furnaces for fusing, &c., must form prominent features in the manufacture. There are two kinds of furnaces, namely, one called the "Calcar," the other "Working Furnace." There is connected with the furnaces an annealing or tempering oven for the last operation.

The calcar, built in the form of an oven, is used for the calcination of the materials preliminary to their fusion and vitrification. This process is of the utmost importance:—it expels all moisture and carbonic acid gas, the presence of which would hazard the destruction of the glass pots in the subsequent stages of the manufacture, while it effects a chemical union between the salt, sand, and metallic oxides, which is to prevent the alkali from fusing and volatilizing, and to ensure the vitrification of the sand in the heat of the working furnace to which the whole of the materials are to be afterwards submitted.

The working furnace, which is round and generally built in the proportion of three yards in diameter to two in height, is divided into three parts, each of which is vaulted. The lower part, made in the form of a crown, contains the fire which is never put out. Ranged round the circumference inside are the glass pots or crucibles, in which the calcined *materiel* is placed to be melted; and from several holes in the arch of the crown below issues a constant flame which, enveloping the crucibles, accomplishes the process of melting. There are a number of mouths round the outside, through which the calcined materials are served into the crucibles inside. The heat is here so intense that the mouths are provided with movable collars or covers, generally composed of lute and brick, to screen the eyes of the workmen who stand outside in recesses formed for the purpose in the projections of the masonry. The severest part of the work arises when any of the pots or crucibles happen to become cracked or worn out, in which case the mouth must be entirely uncovered, the defective pot taken out with iron hooks and forks, and a new one substituted in its place, through the flames, by the hands of the workman. In order to enable him thus literally to work in the fire, he is protected by a garment made of skins in the shape of a pantaloon, and heavily saturated with water. This strange garment completely covers him from head to foot, all except his eyes, which are defended by glasses.

The material being now melted, is fashioned into the desired forms by the hands of the workmen while it is yet hot, and then placed to cool gradually in the annealing oven. This oven is a long low chamber heated at one end, and furnished with movable iron trays or pans, called *fraiches* (from the French), upon which the various articles are set down, and finally removed, when they are sufficiently cold, through an opening which communicates with the room where the finished articles are kept.

The intensity of the fire requires that the furnaces and crucibles should be constructed of materials the least fusible in their nature, and the best calculated to resist the violent and incessant action of heat; or the manufacturer would incur the most serious losses and delays from casualties which, even after the most careful and costly outlay, cannot be always averted. The crucibles especially demand attention in this respect, in consequence of the solvent property of some of the materials which are melted in them. These crucibles are deep pots varying in size according to the extent of the objects of manufacture; and some notion may be formed of the importance attached them from the fact that they are not unfrequently made large enough to contain individually no less than a ton weight of glass.

Great skill and care are requisite in their structure so as to adapt them to the temperature in which their qualities are to be tested; and even with the utmost attention that can be bestowed upon them they are often found to break soon after they are exposed to the furnace, by which heavy losses are entailed upon the manufacturer. Nor is this the only point which must be considered. The size of the crucible should bear a proportionate relation to that of the furnace, or one of two consequences, equally to be avoided, will ensue; either that there will be a waste of fuel, if the crucibles are too small, or an inadequate heat, if they are too large.

The initial movement of the glass-blower is to dip a hollow iron rod or tube, about 5 feet long, through the mouth into one of the crucibles containing the meltedglass. Having collected at the end of the tube a sufficient quantity of material for the article he is about to fashion—a drinking-glass, finger-glass, jug, or whatever it may be (which requires, perhaps, two or three dips, according to the quantity he wants), he withdraws the tube and holds it perpendicularly for a few seconds with the heated mass downwards, till the fluid drops and lengthens by its own momentum beyond the end of the tube. He then quickly raises it, and rolls it on a smooth horizontal plate till it acquires a cylindrical form. When he has got it into this shape, he applies his mouth to the opposite end of the tube, and blows into the heated mass which swiftly becomes distended into a sphere. But as the globe thus obtained is not rendered sufficiently thin for his purpose by a single blowing, he reheats it by holding it within the furnace, and then blows again, repeating the operation till he brings it to the desiderated size and consistency. Thus prepared, he swings it in the air like a pendulum, or twirls it round and round rapidly, according to the elongated or circular form he requires, the molten particles obeying the tendency of the force and motion employed.

Having advanced to this stage, and the mass being ready for fashioning, a new instrument is brought to bear upon. This is a small solid round iron rod, called the pontil, upon one end of which a lesser portion of material is collected by another workwan, and this portion being applied to the extremity of the globe already formed rapidly adheres to it.

The whole is now detached from the tube, or blow pipe, by simply damping the point of contact which causes the glass to crack, so that a stroke upon the tube separates it safely, leaving a small hole in the globe where the tube had originally entered.

By this time the temperature of the mass has cooled down, and it becomes necessary to reheat it, which is done as before. The artificer seats himself on a stool with elevated arms, upon which he rests the pontil, which he grasps and twirls with his left hand, having thus a command over the red-hot glass with his right hand, in which he holds a small iron instrument, called a procello, consisting of two blades with an elastic bow, similar to a sugar tongs. With this little instrument the whole work of fashioning is performed, and as it must be completed while the glass is yet ductile (having always, however, the power of re-heating it when necessary,) the process is effected with wondrous celerity. By the aid of the procello he enlarges or contracts the mass, which he adapts to its motions with his left hand, and where any shapeless excrescences appear, he instantly cuts them off with a pair of scissors, as easily as if they were so much lace or cotton. And thus, almost in less time than it has occupied us in the description, articles of the most exquisite form and delicacy are created by the art-magic of these Vulcans of the glass-furnace.

That which chiefly excites astonishment and admiration in the spectator is the ease and security with which a material so fragile is cut, joined, twirled, pressed out, and contracted, by the hands of the workman. Long practice alone can ensure the requisite certainty and quickness of manipulation, and the eye must be highly educated to its work before it can achive off-hand, and by a sort of acomplished instinct, the beautiful shapes which are thus rapidly produced.

The moment the article is finished, it is detached from the pontil and dropped into a bed of ashes, from whence it is removed while it is yet hot, by a pronged stick or wooden shovel, to the tray to be deposited in the annealing oven where it is gradually cooled, after which it comes out tough and strong.

Without the annealing process glass would be very brittle.

Agricultural Labors of Belgium.

There are two classes of Belgian agricultural labarers. First, there are those who are regularly retained upon the farm, and are lodged, boarded, and paid by the year; to which may also be added other inferior servants, who are not paid by the year, but by the day. Secondly, there are the laborers who live in their own houses, and who are paid by the day for such labor as may be required from them by the neighboring cultivators.

On each farm there are one or more "*varlets de farme*," men who do the ordinary farm-work, plough, sow, and so forth. Of these the superior class receive, in addition to good lodging, and sometimes washing, 200f. per annum. The inferior ones get 150f., or 200f. It should be observed that this is the highest rate, and on many farms the *varlets* do not get more than from 150f. downwards. Next come a class of farm servants who attend to the cows, and who receive about 150f. per annum, with board and lodging. Upon a large farm, however, there are required from time to time more laborers than those regularly retained; and there is another class of laborers who live in their own cottages, and who receive a pretty constant employment in day work, at an average payment of a franc a day. These men are employed in various kinds of hand labor, especially in drain-making, and in some parts they are employed at the harvest time. Women employed as day laborers, but not lodged on the farm, receive from 50c. to 80c. per pay; and children 50c. per day. During the harvest, where wages are paid to day laborers, they range a little higher than usual; for instance, the laborer who ordinarily gets 1f., then gets 1½f. per day. The foregoing account of the rate of annual payment to laborers employed on the farm applies to certain farms held by enlightened cultivators. The general custom is different, and sufficiently primitive to deserve notice. The laborer, according to this practice, acquires a sort of vested interest in the produce of the farm. Throughout the year he is liable to be called upon to do all services directly connected with the crops. At the harvest time comes his harvest also. He cuts the crop; of which he receives the eleventh part, in kind, as his share. He threshes the corn; and for this service (and of course his other work during the year) he receives sometimes the sixteenth and sometimes the eighteenth part of the grain. The sixteenth is given to a few who are employed to thresh very quickly, for the purpose of sowing again. The eighteenth comes to those who are employed more leisurely.

In this practice, which is voluntary, may no doubt be traced the remnant of some abrogated feudal service. Allied as it is with another peculiarity attaching to the Belgian agricultural laborer, it gives him a certain kind of independence, although his fare in general, is miserable and his habitation is far, very far, from being either decent or comfortable. But although this is true, he is nevertheless a proprietor, not in the sense of these pernicious small subdivisions of property which, where they prevail, are the standing obstructions to improved agriculture, but in a way to give him a sense of independence to which the English agricultural laborer is a stranger. The large farms are surrounded—fringed as it were—with laborers' cottages. These are for the most part the property in fee-simple (if the term be known to the Belgian law), of the holder. To each is attached a garden, and frequently a little ground. The garden and the ground, cultivated by the proprietor and his family, yield the vegetables, potatoes, &c., necessary for their subsistence during the year. His share of the crop at harvest time (where he works on that principle) yields him the necessary wheat, &c., and what he does not consume he sells. Those who do no help to raise and reap the crops according to this custom, get their franc a day, which, together with the produce of this little property, and the gains of the youngsters, enables the family to live—that is to say, when things go well. Thus it is not unusual to find a peasant in these parts who is at once proprietor and laborer. A sense of independence (which sits well upon a people naturally courteous) is the natural result. This custom of partition of crops, called "La Dime," like most old customs, stands in the way of agricultural improvements. For instance, you cannot introduce threshing machines consistently with this usage. The larger cultivators, especially those who have received the new lights, are opposed to this costum, and commute the charing system for a regular payment of wages. But at present these are few and far between, and therefore the custom prevails very generally, though the proportion awarded to the laborer differs in different parts; in some being a 20th part for reaping, and a 20th for threshing.

Mahogany for Ship Building.

A very useful little work has been published in Liverpool on the value of mahogany for ship building.

It states that a man of war named the Gibralter, captured from the Spainards, made entirely of mahogany, was recently broken up being 70 years old, and that all her timbers were as sound as the day they were put in, and were afterwards made into tables for the whole British Navy. A ship builder named Chambers, says:—

"I beg to say that I repaired a Spanish brig, about two years ago, which had her sheer-plank and covering-board of mahogany, and most of her upper works. When she was caulked, I found everything good and perfect. I inquired of the captain how long had she been built, and he told me from twenty-three to twenty-four years. I also have in my yard a piece of mahogany, keel of a yacht, which has been under water for at least thirty years, and is as good as the first day it was put to the vessel; and I have seen at Brest, in France a ship-of-war broken up, built entirely of mahogany, and which was upwards of seventy years of age; the timbers were as red and perfect as the first day they were put up; this was about seven years ago. I have, therefore, no doubt of mahogany being as good, if not preferable, for ship building, over any othe wood in the world."

The Liverpool Shipowners' Association recommends mahogany, and state in a letter that "the free and universal use of mahogany, in every part of the construction of a ship, should by all means be encouraged, convinced as we are by the results of very many experiments and long usage, that there is, on the whole, no species of wood (attainable in respect to price) so applicable to ship builders' purposes generally as mahogany, which, for some particular purposes, such as crooks, &c. &c., affords facilities quite peculiar to itself. Its durability, too, seeming to exceed that of all others; it is wholly exempt from dry rot; and from the absence of acid, combines with copper and iron work better than any other wood whatever."

The Messrs Lockett shipbuilders of Liverpool say, "we should prefer it for every part to English oak, as it is not so susceptible of rot, (particularly dry rot,) besides which, iron and copper do not affect it. This we attribute principally to its being free from acid, which is not the case with oak. If we were about to contract with a builder for a twelve years ship, and the regulations would admit mahogany for every part of a vessel, we would give it a preference over every other wood, as we are certain, from twenty years' experience, it is the most durable, besides having the excellent advantage of being much lighter than oak or teak. It has also other considerable advantages, as it can be got in very long lengths for planks, natural-grown croo s, cant pieces, &c., all free from sap.

Here are high testimonials in favor of mahogany as an excellent material for ship-building. It is a great pity that this wood is so expensive, but when the canal is opened through the Isthmus of Darien, we shall have a fine mahogany country opened up to our commerce.

The magnificent steamer Oregon, bound from Louisville to New Orleans, burst her boiler on the 3rd inst., near Vicksburg. The first clerk was killed, the captain was severely hurt, and about thirty persons on board are missing.

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New Inventions.

Improvement in Locomotives.

The English engineers are directing attention to the superiority of Crampton's system of building locomotives by suspending on the extremities of the frame. Mr. Crampton places the driving wheel at the end of the engine instead of the centre, and the wheels carrying about one-half of the whole weight of the engine on them, it is clear that one-half will be on the driving wheels; and by assuming four wheels at the other end to take the other half, the machine in fact, is suspended on the extremities; but in the ordinary machine, the driving wheels being in the centre, with half the weight on them, the other half is necessarily equally distributed on the fore and hind wheels, having the effect of a balance beam action—one of the greatest causes of oscillation.

To accomplish the same result, the superintending engineers, Mr. D. Gooch, of the Great Western, and Mr. Sturrock, of the Great Nothern railway, have had their attention directed to the system of suspending their engines on their extremities; and they have succeeded in a great measure, with coupled engines of the ordinary construction, by applying compensating springs, which have the effect, to a certain extent, of placing the weight of the engine on the extreme ends.

Electro-Magnetic Engine.---A New Safeguard Wanted.

The experiments of Prof. Page, of Washington, towards producing an engine of practical utility as a prime motor of galvanic power, and for which $20,000, I believe, was appropriated, appears to have ended in no solid benefit to the cause of science. I have seen it stated that he had an engine which was called a five horse-power, and yet it was only able to drive a small circular saw, ten inches in diameter. This could be done by a steam engine of one horse-power. I have seen it stated that the electrical engine lost speed in a wonderful manner when set in motion to do something useful. What would be the cost of a large engine of 100 horse power, built upon the principle of Prof. Page's, and operated by the same agent? I would say, "judge not lest ye be judged," but upon consideration I believe it would be more wise, and would also exhibit a more becoming spirit of humanity in our Congress, if an appropriation was made for the invention of some plan or plans of safeguards, to prevent accidents on steamboats and collisions on railways. Many such calamities, I believe, can be avoided, for I believe that there are men in our country who, if a reward was held out to them for some new and useful invention for the purpose stated, would direct their minds to the subject, and produce something useful to accomplish the desired objects. S. S.

Philadelphia, 1851.

Collecting Gold by a New Chemical Process.

Prof. Torrey of this city, in a recent lecture, stated that the washing process of gold in California, often results in a large quantity of ferruginous sand, mixed with a large proportion of gold, which cannot be removed by washing. If the mercurial process is attempted, the amalgam will not coalesce, and the mercury can only be recovered by distillation, leaving the gold where it was. Even the expensive solvent, aqua-regia, will not act. But it was discovered nearly a year since, that chloride of lime will take it out as readily as water will remove sugar from sand. From this solution copperas-water will throw down the gold in a metallic powder, perfectly pure.

The latter part we know to be correct, but cannot assert positively that the primary process will do all that has been claimed for it.

New application of the Daguerreotype.

The Waterbury, Conn., American says,—Mr. Hiram Hayden, an ingenious artist of this village, has shown us three landscape views taken by the usual Daguerrean apparatus upon a white paper surface, all at one operation. This is the first successful attempt to produce a positive picture by this extraordinary medium. The pictures exhibit the effect of light and shade, similar to a fine engraving, bringing out the most delicate minutiæ, with the fidelity of the ordinary Daguerreotype.

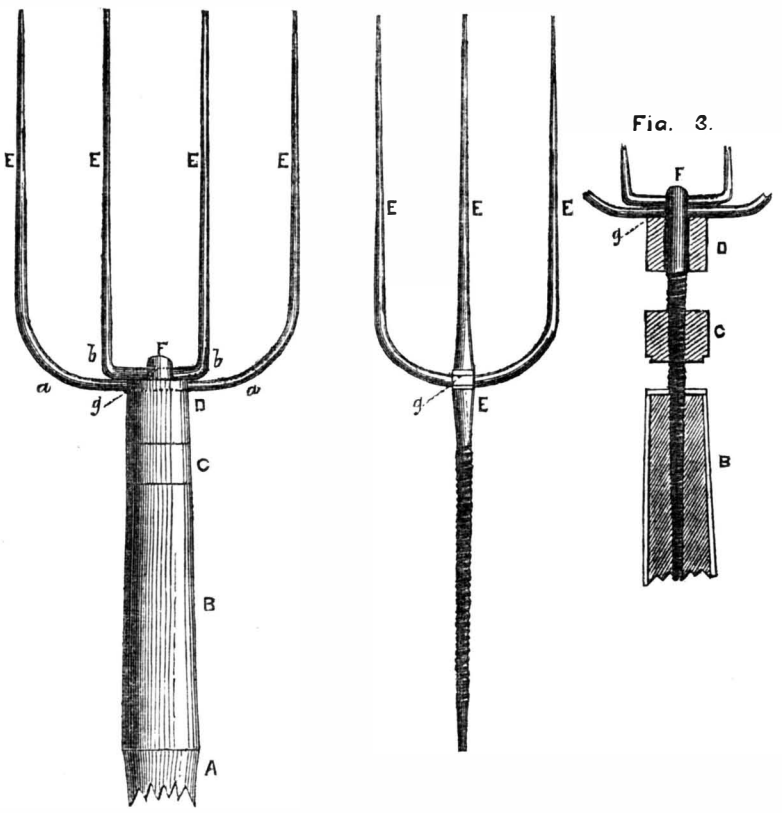
[This is certainly a great discovery. But the puzzling part is to account for the production of pictures on a piece of white paper. What made the shade? That's the query.

Photography---The Whitened Camera.

We find in the last received number of the London Anthenæum a letter from W. E. Kilburn, "Photographer to the Queen," on the subject of M. Blanquart-Everard's new mode of using a whitened instead of darkened camera in taking sun pictures. He says that he has, since seeing the notice of the new process operated daily with a whitened camera "on every variety of subject," and he sends the Athenænm specimens of the results obtained. He adds:—"I support to a certain degree the opinion of M. Everard that his arrangement quickens the process, but not to the extent claimed by him:—and, as a matter of course, it would assist in the formation of an image by light too feeble with the box blackened. I think it is also of service in making very dark shadows less opaque.

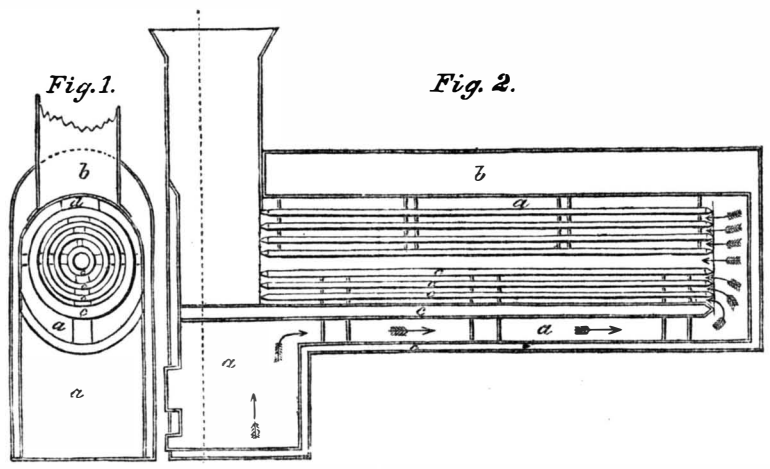
IMPROVEMENT IN AGRICULTURAL PITCHFORKS.

Figure 1. Figure 2.



The accompanying engravings illustrate the invention noticed by us before on page 180. It is the invention of Mr. George Ransom, of Chester, Conn., who has applied for a patent. Figure 1 is a front view of the fork with four tines; fig. 2 shows the manner in which a three tined fork is constructed, and fig. 3 is a jection of a four tined fork. The same letters refer to like parts. This pitchfork is so made that it can be changed from a two to a four tined fork, and *vice versa*, at pleasure. A is the handle; B is that part of the handle which receives the screw shank of the fork; C is a nut, and D is a collar. E E are the tines of the fork; F is a screw rod or shank which fits into the nut end of the handle, A. This shank has an oblong eye (not seen), at *g*, in its side near the outer end. The tines are put through this slot, and the shank, F, screwed into its socket in the handle, thus completely tightening the tines in the eye. It will therefore be readily perceived that two tines can as easily be secured and used in this way as the four tines represented. The bends of the tines are represented by *a a* and *b b*, and they are so made that the tines will go through the eye, *g*, and be turned up with the shoulders in their proper position to be screwed up by the nut, C. The three tined fork is made with the middle tine, E, fig. 2 extended into the screw shank with the eye, *g*, made in it through which the double tines are inserted, otherwise it is the same as the one described. By this description, and the engravings, every person will be enabled to understand Mr. Ransom's improvements; other information may be obtained by letter addressed to him at the place mentioned above.

CHAMPION'S ANNULAR STEAM BOILER.



This boiler is the invention of Mr. Thomas Champion, of Philadelphia, and was secured to him by patent on the 19th of last month; the claim will be found on page 190, Sci. Am. Two views of the boiler are here presented. Fig. 1 is an end view, with the outside plate removed to show the ends of the annular cylinders. Fig. 2 is a longitudinal section. The same letters refer to like parts. The boiler is very simple and will be easily understood by attending to the following description; *a a* represent the fire box, and the arrows in the spaces marked, *a*, show a large fire space nearly surrounding the annular cylinders. The heated air and products of combustion are made to return as shown by the arrows at the back and through the spaces between the cylinders, *c c c c*, and pass up the smoke pipe, thus presenting a large heating surface with return spaces, it may be said to get all the benefit of the fuel. There are a number of large evaporation openings communicating with all the cylinders, but *d* is the upper opening above the annular cylinders, to allow the free using of the steam into the steam chamber, *b*, above. The openings spoken of will be observed more particularly in fig. 1 as extending around the cylinders, uniting them together, and answering the four-fold purpose of braces securing the cylinders firmly together, allowing the free ebullition of the water and passage of the steam upwards into the steam chamber, *b*, and also the settling of dirt and impurities to the bottom part, where they may be blown out by a blow pipe, to keep the boiler free from incrustations. They also expose more fire surface, and thereby tend to more rapid evaporation.

It will be observed that this improved boiler has many advantages. According to the space which it occupies, it exposes more than double the amount of heating surface of any other boiler in use. Its form being cylindrical, it embraces strength in its construction, as well as economy of space. Its general construction is such that it affords every facility for a good draught, and Mr. Champion believes that he can save at least one-third of the fuel now used in the best steamship boilers.

More information can be obtained by letter addressed to Mr. Champion, No 465 Callowhill, above 12th street, Philadelphia.

The Patent Office Edifice.

A correspondent from Washington, says "Congress adjourned without granting the request of the Secretary of the Interior in relation to altering the plan of the west wing of the Patent Office Building, for the accommodation of his department. Your article saved the building to the inventors.

It is said that Mr. George Curtis, of Boston, has been appointed Commissioner of Patents"

[We have seen the latter paragraph almost in all our exchanges. We still doubt the correctness of such statements; such action we do not think would be judicious. If we have done any good for the honor or interests of our inventors, we claim no praise—we only did our duty.

Subscribers, Attend!

While we remind many of our patrons that their subscriptions expire with this number, we would also suggest that now is an excellent time for new subscribers to forward their names with those old subscribers who will be remitting their dollar for the balance of the Volume.

For the information of those who may wish to become subscribers, we would say the first half of the present Volume may be obtained by remitting an extra dollar. Any one who may desire to obtain the previous Volume complete [Vol. 5] is informed that we have a few bound copies yet to dispose of, which may be had at $2,75 each; also a few sets in sheets, which may be sent by mail, price $2.

It is an invariable custom of the publishers of the Scientific American to erase every name from the mail books as soon as the time for which subscribers have pre-paid expires, therefore those who commenced with this Volume, and have paid but one dollar, are reminded that their subscriptions expire with this number, and that their papers will be discontinued until further orders, according to previous custom.

Ma ufacture of Salt in New York.

The whole number of bushels of salt manufactured and inspected on the Onondago Salt Springs Reservation, during the year ending Dec. 31, 1850, is 4,268,919 bushels—814,450 bushels less than in 1849. The decrease the past year is thought to be owing to the very large amount manufactured the previous year.

The cost of salt made by artificial heat at the works, has not exceeded, during the past year, 10 cents per bushel of 56 lbs., including the duty paid to the State; and that of solar salt, 14 cents.

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Scientific American

NEW YORK, MARCH 15, 1851.

To Our Patrons.

This number completes the half of Volume Six, Scientific American. It is our rule to take subscriptions for six months, being one dollar fer that period. Many subscribers have commenced at the half of former volumes, and we have a number who prefer to forward their subscriptions half yearly. We prefer to have our subscribers commence at the beginning of the volume, and those who now desire back numbers for this volume can be supplied. But there are many who cannot afford to pay the amount of $2 at one time, because they are laboring at very unremunerative occupations, and to them the half yearly subscription plan has conveniences of which they can and do avail themselves. We are very proud of our large number of half yearly subscribers, because, it shows that we have a great many men among us, who although not possessed of wealth, are in the possession of a taste for what is useful and instructive.

The price of the Scientific American is not high, considering the kind of information contained in our columns. We could publish a paper much larger, at less expense, if it only contained common reading matter. The quality of a paper is its principal feature, and we have endeavored to make ours the first of its kind in our country. It has taken much labor, expense, and patience to do this. Our class of readers must have a peculiar turn of mind, and a taste for scientific and mechanical information. The number of people possessing such tastes is not great in any community, hence our circulation is necessarily spread over a very wide surface. Our paper is very generally known throughout our country, still there are many, no doubt, who are not yet acquainted with us, and whose tastes, if they were, would lead them to be subscribers. Our readers have always been very kind in endeavoring to extend our circulation. No paper has had so much done for it in this way as the Scientific American. We still trust to that same kindness for continued and new favors. We try to do all we reasonably can for subscribers, by way of giving them any information they may require, and in giving advice. In this respect we are guided, we humbly trust, by truth, honesty, and candor.

Those who have patent business to transact, such as applications for patents, can have their business done by us in a very superior manner and at very reasonable rates. The members of our establishment, such as our Examiners, &c, are very competent men,—they are practically and theoretically acquainted with chemistry, engineering, and machinery. We transact a great deal of business in procuring foreign patents, and our facilities for procuring the same in Great Britain, France and all other nations, are not surpassed —if equalled, by any other establishment in our country. We have had great experience in procuring patents for American inventions, and we believe that we have given universal satisfaction.

Those who desire to be acquainted with all the claims of the patents granted at Washington cannot be without our paper. The Scientific American is the only paper in the country which publishes, officially, the claims of patents granted every week as they are issued. It contains more notices of new inventions than any other paper, and the general information contained in our columns is selected from rare and valuable sources, able contributions, and is useful and trustworthy.

In conclusion we return our sincere thanks to our subscribers for past favors, and hope for their continuance, which, by Divine blessing, we will endeavor to make of ourselves and paper more worthy, week by week.

It is our intention to keep posted up on the World's Fair, and to have a regular weekly London Correspondence, giving a description of the most interesting articles exhibited, and other useful information ; this of itself will be worth the price of subscription.

New York Historical Society---Fitch and Fulton.

A regular monthly meeting of this Society was held on Tuesday evening, last week, at the rooms of the University, and among a number of interesting papers read, was one by the Rev. Mr. Parker, of the Floating Church of our Saviour, on the shipping of the United States, and about the early attempts at steam navigation by our early inventors.

Upon the subject of Fulton's claim, Mr. Parker remarked that he could do no better than to state in the words of another, (the eloquent Mr. H. G. Tuckerman,) that "it is a very narrow view of Fulton's claims to grateful respect which estimates them solely according to the degree of originality he manifested in the application of steam to navigation. The great fact in the controversy remains indisputable, that the only inventor who persevered in giving a practical use to the knowledge already gained on the subject, and continued to try experiments until crowned with a success which introduced steam navigation, *was Robert Fulton.*

Dr. Griswold then remarked that he had read with great surprise and regret the altogether erroneous observations of the magazine writer quoted by Mr. Parker upon the subject of Fulton's experiments. At this day it was simply absurd to allege that Fulton made the first successful experiment in steam navigation. To claim such credit for Fulton, was to abandon it for the country. In England the matter had been much discussed recently, and it was easy to perceive that the claims of Symington could be maintained against those of Fulton—against any claims but those of John Fitch—since the pretensions of De Garay at Barcelona, Hulls in England, Miller in Scotland, and Jouffroy in France, were too vague and unintelligible to deserve consideration. Symington's boat was constructed in 1788, and its greatest speed was five miles an hour, upon one of the highland lakes of Scotland, and in the following year seven miles, upon the Clyde. Fitch, who was a poor man, and uneducated, possessod unquestionable genius; the vision of steamboats had haunted him half his life, and the details of his first boat had been arranged in his mind at least two years, when he launched upon the Delaware, in 1787, the *Perseverance*—the precursor of the fleets of steamers which now swarm the rivers, lakes, and seas of the world. This was *ten years* before Fulton built his boat upon the Hudson, and one year before Symington (to whom and to other forign claimants of the discovery the intelligence of Fitch's plans probably suggested all they accomplished) made his trial on Loch Dalswinton.

Mr. Griswold stated that he had written a brief memoir on the subject some years ago. This may account for the position h eassumed, but it is exceedingly ridiculous to assume such a position. It amounts to this :—"It can be proven that experiments were made in Europe with steamboats before Fulton built the Clermont, we must therefore fall back upon Fitch to prove that America made the first successful experiments." Now we say that, essentially, the Clermont made the first successful experiment. To abandon this ground—to fall back upon any other claim, is to surrender it for our country. Dr. Griswold certainly did not, as a fair historian should do, deal fairly with the claims of Hulls and Miller. They might be too vague for him but not for others.

Passing to the subject of Fitch and Fulton's experiments in Steam Navigation, Mr. Parker entered into an elaborate disquisition on the disputed question of priority. He adduced the testimony of various witnesses (three of whom were present at the meeting) to show that Mr. Fitch unquestionably made the first experiments with steam on the "Collect" in September, 1797. Mr. Fulton and Chancellor Livingston were on board Fitch's vessel on this first trip.

Mr. Parker had procured a model of the boat with which John Fitch mad) his experiments on the Collect Pond in New York, (the site now occupied in part by the "Halls of Justice,") in the year 1797. It was on the table during the evening; as well as a model of the boat of Mr. Fulton, made by Mr. John Clark, who worked on board the "Clermont" during the first trip to Albany in 1807. Mr. Clark, who is now 82 years ofage, was present at this meeting. The model of Fitch's boat, first alluded to, represented the boilers, paddle-wheels, screw-propeller, &c., used by Fitch. It was the work of Mr. John Hutchings, (now living at No 3 Westley-Place, Williamsburgh,) who assisted in setting the boiler and steered the boat for Mr. Fitch during his first experiments on the Collect, in 1797.

There can be no doubt but this boat was made for the occasion, from memory. There is one point on which we should like information, that is, all the accounts that we have read of Robert Fulton agree that he went to Europe in 1786 and did not return till 1806, and that he was experimenting in France with Joel Barlow in 1797, the very year Mr. Hutchings asserts him to have been in New York. Now is Mr. Hutchings not mistaken. Who will throw some more light on the subject. Our venerable correspondent, W. F., of Boston, who witnessed the experiments in France, we have no doubt can set the matter right.

Paine's Electric Light.

MESSRS. EDITORS—Allow me, through your paper, to defend myself from your correspondent, "J. T.," in the article "Hydrogen—Benzole," in No. 23. If "J. T." had taken the trouble to read my article before criticising it, he might both have saved himself the trouble of writing his indefinite article, and me the trouble of replying to his thoughtless insinuations and misstatements.

Several such vague notices of my article have led many persons to think that you were a believer in Mr. Paine's extravagance, and that I had corroborated his supposed discoveries; yet, in my article, I did not use Mr. Paine's name, and spoke of the affair as "an old experiment—the philosophical candle," and it does not contain any thing to lead any rational person to suppose that I attributed any discovery to him (Mr. Paine.) There is no person who knows better than yourselves that I never doubted the erroneousness of Mr. Paine's assertions as to the main features of his affair, and your own published opinions have uniformly been against him.

To define my position clearly, I will briefly state the circumstances that led to the publication of my article in your columns. First, Mr. Paine asserted that he could produce hydrogen almost without cost and use it for illumination. Second, your correspondent, "Carburetted Hydrogen," inquired how he converted the hydrogen into carburetted hydrogen. Third, Mr. Paine replied that he did not so convert it. Fourth, "Carburetted Hydrogen" replied that hydrogen could not be used for illuminating unless so converted. Fifth, Mr. Paine replied that one pint of turpentine would render 10,000 cubic feet of hydregen fit for illumination. Sixth, "Carburetted Hydrogen" denied that turpentine would render hydrogen effulgent in combination, and so did almost everybody. In this state of the affair the Scientific Committee visited Mr. Paine's house, and concluded that he burned carburetted hydrogen (rosin gas), and that he did not make hydrogen fit for illumination by passing it through turpentine.

It was no secret to me that camphene would render hydrogen effulgent in combination, and being anxious to stop the progress of deception, and well knowing that Mr. Paine would get another committee together and prove the Scientific Committee were wrong on an important point, and thus establish the chimera more extensively and deeper than before, I therefore measured a portion of turpentine and passed one ounce (12 cubic feet) of hydrogen through it, and sent you the results, viz., that I had a beautiful light. That the light was not owing to combustion of the vapor of turpentine, because cooling the gas and turpentine did not prevent it, and that the quantity of turpentine evaporated would not have afforded the light by a long way. And that the gas was not converted into carburetted hydrogen [$C^4.H^4$.], because I had passed sufficient hydrogen through the turpentine to have decomposed it many times over. But I did not assert that I placed the turpentine in a *freezing mixture*, as "J. T." erroneously asserts I said; neither did I say that the turpentine did not lose weight—but that, after passing 1 oz. of hydrogen through 3 half pints of turpentine, it was not perceptibly less (by measure), and that after passing another considerable quantity of gas through the same turpentine, it was scarcely a teaspoonful less than at first. Any person whose forehead is not in subjection to the occiput, would suppose that I was aware of the turpentine being evaporated into the atmosphere of hydrogen,—and I never supposed the hydrogen was rendered effulgent by anything else than the vapor of turpentine, but I deny that the light is "altogether due to combustion of turpentine."

Now, if "J. T." wishes to display his abilities, let him prove that the hydrogen becomes carburetted hydrogen [$C^4.H^4$.], or else let him show that the "whole illuminating power depends on the presence and combustion of turpentine," by passing nitrogen through cold turpentine and getting a bright light.

I have no fault with Mr. Paine for using the word "*catalyzed*" to indicate the effect produced by the turpentine; until the action of the camphene is elucidated, "catalyzed" will express this effect as well as any other word. Moreover "catalyzed" has no specific meaning in chemistry excepting to express something not understood, and able chemists object to its use entirely; and I think it would be as well for wiseacres to either show the atomic constitution of the altered hydrogen, or define the word *catalyzed*, before quarrelling about the gas being catalyzed.

There are two ways to put down a supposed humbug: one is to hold the theory up to the light; the other is to denounce everything the humbugger says, and rail at every one who will not join the denouncements. I prefer the former, and "J. T." may use the latter without my opposition.

And let me say to "J. T.," in return for insinuating that I have helped to build up the chimera by corroborating Mr. Paine's statements :—It is not certificates, however, for Mr. Paine which have strengthened the delusion, but such unphilosophical attempts at exposing it, as that of his. What has Mr. Colton's certificate done? Merely shown that Messrs. Colton and Paine, by being ignorant of the first principles of electrical science, and not knowing the difference between electro statics and electro dynamics, attribute the conducting power to the surface instead of the solid section; and so Mr. Paine is spoiled by his own helper; but as soon as some scientific man comes out and offers to expose the deception, and gets himself into a ridiculous position, then Paine's stock rises. Puerile conjectures as to how the thing is effected, are the very gas that has fed this *ignus fatuus*. One defect of an opposing enemy is of more advantage to an advancing army than for them to occupy a hundred impregnable positions.

"J. T." has conjectured that "these mysterious hollow wires may lead to the hiding place of veritable carburetted hydrogen." Will he but condescend to inform us how Mr. Paine manages to make the carburetted hydrogen traverse long strips of copper 1-50th of an inch thick and 4-8ths wide?—they are veritable strips, bent and bruised (I had them in my hand and saw they were not pipes), with their ends mashed up to put into a binding screw hole.

But least "J. T." should think I am, after all, a believer in Paineism, let me say that I, too, do not believe that the gas is made by the action of the magnetic electric machine, not because it is beyond my noddle to comprehend it, but because the electric current does not decompose the water in the tumbler where the copper strips are inserted before reaching the so-called electrode jar (see the wood cut in the Boston papers.)

Very truly, GEORGE MATHIOT.

Washington, March 7, 1851.

[We endorse the reference made by Mr. Mathiot respecting our knowledge of his private opinions on Paine's alleged discovery.—ED.

The last news from California exhibits no abatement in gold wonders. More than $2,000,000 of dust have arrived at this port since our last paper was issued.

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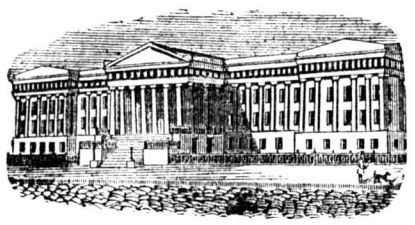

☞ Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.

FOR THE WEEK ENDING MARCH 4, 1851.

To Wm. Brewer & John Smith, of the County of Surrey, England, for improvement in Paper Moulds. Ante-dated Feb. 12, 1849.

We claim as our invention the improved moulds for the manufacture of paper, as made in the manner herein specified, that is to say by stamping or forming such moulds, partly or wholly, in and by dies, and afterwards removing the back of such mould, by filing or other process analogous thereto.

To Junius Judson, Jr., of New York, N. Y., for improvement in Power Governor.

I claim communicating the action of governors to the valves, or other parts of machinery governed thereby, in such a manner as to cause, by accelerating or retarding the motion of said valves, large amounts of regulating power to be added to or taken from the engine by a given change of the speed when the motion of the engine becomes too much retarded, whether such retardation arises from increase of work or resistance, or from diminution of the tension of the moving force, and also small amounts of regulating power to be added to or taken from the engine, by a like change of speed, when the motion is too much accelerated, whether such acceleration arises from diminution of work or resistance, or from increase in the tension of the moving force, as herein set forth.

Second, I also claim connecting the valve arm, or part to be regulated, to the regulator, by a cam or its equivalent, having progressive rates of action, when the same is employed for transmitting the action of governors to the parts of machinery to be governed, and for the purpose of causing the motions of valves, gates, wires, or other analogous parts, to take place rapidly and slowly, for the regulation of high speeds, substantially in the manner and for the purpose set forth.

Third, I also claim making the eccentric curve of the vibrating cam to vary its position with respect to its centre of vibration, for the purpose of varying the rapidity and extent of opening of the valve, according to the pressure of steam, in the manner herein set forth.

To John W. Nystrom. of Philadelphia, Pa., for improvement in Calculating Machines.

I claim, first, the trigonometric curves of the inner scale, in combination with the graduated arms and logarithmic curves of the outer scale, the curves being laid out substantially in the manner herein described.

Third, I claim the two graduated arms, constructed in such a manner that they can be moved in connection or independently, substantially in the manner and for the purposes herein set forth.

[Has the P. O. left out the second claim in copying our list?]

To Bernard O'Neill, of Reading, Pa., for improved method of bracing the water spaces of boilers.

I claim the method herein described, of bracing and securing the shells of boilers or fire boxes of locomotives and other engines, by means of ribands of sleeves, or other starting sleeves, so that when a bolt or bolts are to be removed, to cure leaks, or to remove the sheets in the fire box, the sleeves will remain in place, serving as a guide to punch the new sheets by, and affording greater support to the shells, both in backing out the old and riveting the new bolts as herein fully described and shown.

To H. H. Snow, of New Haven, Conn., for improvement in Peppermint Droppers.

I claim, first, the combination of a peppermint dropper, by combining a sugar kettle with a revolving cutter.

Second, the combination of such dropper, either with a railway, the dropping sheet being stationary or with a movable dropping sheet, the dropper itself being stationary; or with a railway and a movable dropping sheet combined, all substantially as herein described.

To Henry Waterman, of New York, N. Y., for variable Cut-Off, regulated by the governor.

I claim regulating a variable cut-off valve, by a motion derived from and corresponding to that of the governor, by means of a toe or vibrating lever attached to the rock shaft, acted upon by revolving pins or cams, when either the cams are made to vary in position, with respect to the toe, or the toe in length, with respect to the cams, the whole machinery being constructed, and acting substantially as herein described.

To E. P. Gaines, of Nacogdoches, Texas, for improvement in dressing mill stones.

I claim the new and improved mode of dressing mill stone, which I have described as fully and correctly as I can.

RE-ISSUES.

To John Jones, of Clyde, N. Y., for improvement in Carriages. Originally patented Jan. 14, 1851.

I claim the arrangement of two bars or reaches, placed in connection with the straight reach, as above described, and in combination with the spring rod and cross bar, substantially in the manner described.

To Charles Wilson. of Springfield, Mass., for improvement in cutting stone. Originally patented March 13, 1847.

I claim the method, substantially as above described, of dressing, facing, or reducing stone and other like materials, by means of a rolling edge or edges acting against the face, or surface of the material to be worked, substantially as herein described.

DESIGNS.

To Gardner Chilson, of Boston, Mass., for Design for Furnace Registers.

I claim the new design herein above described, for a register in the form of a circle, having within and near to its outer ring, two concentric rings, the space between each of said rings being ornamented with curved lattice work, forming hyperbola-shaped openings, and a ring in its centre, enclosing an eight-leaved star, with a small circle in its centre and curved and notched branches radiating from the said ring to the smaller of the outer rings, forming irregular and heart-shaped openings, all as described.

To Gardner Chilson, of Boston, Mass., for Design for Furnace Registers

I claim the new design described for a register for furnaces, &c., of rectangular form, having within it a smaller rectangle, connected to the edge of the register by curved bars, said inner rectangle having a square in each corner, and small rectangles within its sides; said squares being ornamented with curved bars, forming the lattice work, &c., and said smaller rectangles being ornamented with semicircular and diamond-shaped lattice work, and a rectangle in the centre of the register, ornamented with irregular curved branches or bars, proceeding from its sides to a ring enclosing a four-notched leaved star; the whole forming a lattice or open work for the heat to pass through, as described.

To Gardner Chilson, of Boston, Mass., for Design for Furnace Registers.

I claim the new design, herein described, for a register of rectangular form, having within its sides, two smaller rectangles, one within the other, the space between the outer bars of the register, and the larger rectangle being ornamented with curved lattice work, and the triangular openings, and the space between the two inner rectangles being ornamented with irregular heart and diamond-shaped openings, while the centre of the register is occupied by a five oval leaved star, in a ring, with curved and notched branches or bars running from said ring to the inner rectangle, all as herein described.

To Gardner Chilson, of Boston, Mass., for design for Furnace Registers.

I claim the new design herein described, for a register of rectangular form, having within its sides a smaller rectangle, the space between the two being ornamented with the circular and diamond-shaped lattice work shown in the drawing, the inner rectangle being ornamented with irregular curved bars or branches running from its sides to a ring in its centre, which encloses a five pointed star with curved sides, the whole forming a lattice work for the passage of the heat, all as herein described.

To S. W. Gibbs, of Albany, N. Y., (assignor to Jagger, Treadwell & Perry), three Designs for Stoves.

J. S. Perry, of Albany, N. Y., for Design for Stoves.

Oars and Levers.

MESSRS. EDITORS—I wish you to look at your answer to the question of "A. V. P." in a late number of the Scientific American, and see if there is not an error. As I understand the process of rowing a boat, the speed depends upon the pressure on the end of the blade of the oar outboard. For instance, I take a 15 foot oar, 10 feet outboard and 5 feet inboard—I suppose it takes 100 lbs. on the outer end of the oar to move the boat at a given speed, consequently 200 lbs. will be required on the end inboard to balance it—this brings a force upon the oarlock of 300 lbs. I will now change the position of the hands 2½ feet from the oarlock. To balance the 100 lbs. on the blade of the oar, it takes 400 lbs. upon the point where the power is applied, making an additional pressure on the oarlock of 200 lbs.; the power applied in the last case will be double, but the pressure upon the oarlock I think will not be. In both applications of my power I wish to keep the speed of the boat the same. S. R. PALMER.

Belfast, Me.

[The great difficulty, with many, in treating on such subjects, is the want of commencing the discussion at the right point—the base line of the argument. In treating of levers, as Maclaurin has set forth in his series of short but clear articles on Mechanical Principles—the base line of the proposition is the *examen* (the needle of the ballance beam). It is quite true that "the speed of a boat depends upon the pressure on the outer end of the oar," as one condition, but not the only one, for that pressure depends entirely upon the power applied inside, and the velocity with which it is applied. Our correspondent has treated the question almost entirely as one of *statics*, whereas it is one belonging to *dynamics*. He should have commenced to apply the figure from the inside instead of the outside of the oar; and, first of all, he should have balanced the oar. Put the whole of the oar outside and then we have the whole leverage from the outside on the oar, but would the boat move an inch? No, because no one rows from the outside, and there is no direct pressure inside. Let the whole leverage be from the inside, and would the boat move? No, because there is no outside back pressure. In moving a boat there are two pressures, the inside direct pressure and the outside back pressure, and yet these two do not determine the speed of the boat, for the line of pressure or action is just as important. One oarsman may exert a force of 600 lbs., on his oar and another only 400 lbs., and yet the latter, by the line of action, about 45°, kept by his oar, will beat the former, if the former moves his oar in a line of 55°. Let us take the oar 15 feet long, and let it be balanced at 7½ feet. Now let us try to run the boat without an oarlock (fulcrum), and what can be done? Nothing. Place the oar in the fulcrum or oarlock, and exert a force of 300 lbs. at each stroke, and make 20 strokes per minute, and what force then have we got to move the boat? Why, the back pressure on the oar, is that which propels the boat, and is exactly proportioned to the amount applied which must be 300 lbs., and if each stroke is three feet, we have the boat moved 60 feet in one minute by the force applied of 300 lbs. Now, upon the principle of leverage, if we shift the fulcrum of the oar to 5 feet from the inner end, we shall have 10 feet outside, which with 300 lbs. active pressure loses one third of the leverage, but then it gains one-third in the velocity from the inside, and this exactly balances the long sweep on the outside with its greater leverage. Time, pressure, and space, must all be taken into consideration. As we extend the length of oar outside, we decrease the amount of pressure (300 lbs.) at every point of its sweep in proportion to its increase of length over the inner end, where the power is applied, and this just brings about a balance of forces. Thus, lever 15 feet, 300 lbs. pressure—15×300÷2=2250, where the oar is balanced. Change the oar to the conditions mentioned by our correspondent, and we have 15×300÷1-3 (or 5ft.)=1500; then 15×300÷2-3 (or 10 feet)=750, and this is 1500+750=2250, the exact pressure mentioned above, (1-3+1-6=1-2). When the conditions are changed, such as more power applied inside, when the lever is shortened, more speed will be obtained, and, on the other hand, if the lever is extended, with a decrease of power applied, the speed will be decreased. The changing of the oar in the lock in any sensible degree, however, must not be looked upon like the mere calculation of a common lever, the back pressure is exerted in a peculiar element, and whatever change is made, there is not only the calculation of weight, and length of lever to be taken into consideration, but the direction of all the forces—a problem which has merely been touched upon by us, in speaking of the angle of action.

The Cheap Postage Law.

The law, reducing the rates of letter postage to three cents when pre-paid, and five cents when not pre-paid, for any distance in the United States, and also reducing the postage on newspapers, goes into operation on the first of July next, with the exception of the coinage of three cent pieces, ordered by it, which is to be commenced immediately. That our readers may see at a glance what the postage on the Scientific American will be after the 1st of July next, we give the following table:—

RATES OF POSTAGE.

Delivered in the County of New York,	*Free.*
Postage within 50 miles of ditto, (per Quarter of a Year) . . .	5 cts.
From 50 miles to any distance not exceeding 300 miles from New York,	10 cts.
For any distance from 300 to 1,000 miles, ...	15 cts.
For any distance from 1,000 to 2,000 miles, ...	20 cts.
For any distance from 2,000 to 4,000 miles, ...	25 cts.
From 4,000 miles to any distance in the United States, ...	30 cts.

The above rates, it will be observed by many of our patrons, will render the expense of the Scientific American much less to them per year, while the slight difference to those who live at a great distance, we hope, will not induce them to withdraw their patronage.

Next week we shall present, aside from our usual variety of mechanical engravings, some beautiful specimens of the Seventeen-Year Locust which, it is said, will appear in the State of Virginia and Pennsylvania during the coming season, producing sad destruction to the grain crops.

New Floating Railroad.

A first rate plan for crossing at Rouse's Point between Canada and the United States. On the Vermont side a very extensive pier has been made by driving piles for some thousands of feet from the shore, to such a distance from the bank as to reduce the channel to the width of 400 feet. A large vessel has been built of such dimensions as exactly to correspond with this 400 feet channel, and upon the deck of this vessel iron rails are laid. Thus, when she is swung into the gap, there will be the continuous track required for the carriages, as there would be if there were really a bridge; and when the trains have passed over, there will be again the 400 feet of clear water way for the passage of craft.

As Congress has now adjourned, we hope to hear of fewer political speeches being made and more political capital, in the shape of common sense, invested in the national bank of all parties.

A tombstone in Jersey bears the following epitaph; "Died of thin shoes, January, 1839." A truthful epitaph.

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TO CORRESPONDENTS.

"A. C., of N. Y."—The process referred to is the invention of D. P. Bonnell, Tecumseh., Mich. He states in his claim that he "gets a greater quantity of superfine flour out of any given amount of wheat than is now obtained by any known method."

"S. H. P., of Ind."—The way to manufacture it into good manure, is to add a little copperas dissolved in water every day, and some plaster of Paris afterwards, by hand, then, when the recepticle is full, take it out till it is dry, when it may be ground and makes first rate vegetable stimulant. The odor is kept down by this plan, and the valuable salts of the manure retained.

"H. A. D., of Vt."—Address Reuben Rich, Salmon River, Oswego Co., N. Y. He is the patentee of a wheel to suit you.

"J. McC., of N. Y."—The principle of your telegraph is very old. Essentially the same arrangement of plates was employed by Renald in 1823, and in 1840 by Wheastone, in a modified form.

"G. W. S., of P——."—We cannot give you the information wanted at present, but will try and get it, when you may hear from us in our columns as usual.

"C. C. M., of Me."—By remitting to us $6 we can furnish you the balance of Griffith's work by mail. When you order please mention the numbers you have, and the balance will be promptly sent.

"O. T., of Vt."—Sliding pistons are well known in rotary engines, and perhaps operated essentially in the same manner as shown in the model sent. No patent could be obtained upon it.

"G. W, D, of Vt."—There is no such institution as you refer to, that we know of, in the country. Dr. Turner, of this city, is the head and front of the profession here.

"L. B., of Md."—We cannot give such information about the wood screw machine as you require, which we regret.

"J. P. A., of Ky."—See the advertisement of Mr. Leavitt in No. 25. We do not know who makes machinery for carding hemp tow; perhaps some of our readers can inform us.

"L. C., of Iowa."—We have seen saw teeth arranged essentially the same as shown in your sketch.

"C. E. L., of Pa."—We do not understand the subject as you set it forth. The properties will not amalgamate sufficiently well to warrant an attempt. We have made the experiment several times, and to no purpose.

"J. B., of N. Y."—Your description of the mill and the improvement for the better regulation of the feed, and to run at a greater speed, gives us a new idea of the nature of the improvement. We think that a patent may be granted. If there is the least improvement made, a patent, in justice, should be granted.

"S. DeV., of N. Y."—We believe that your plan is a very good one—in fact, we cannot see any reason to doubt its successful operation, but we do not see how we could base a claim upon it, as the devices of which it is composed are not new, even in union.

"A. C., of Conn."—Your boiler article had been laid aside, but we have found it. Your plan appears to be a good one, but there is a plan on page 407, Vol. 3, Glasgow Practical Mechanics' Magazine, which is worthy of your attention and aims at the same results as yours. Your last letter has been received and we agree with you that the light locomotive for plank or common roads would be of great benefit. We have seen a steam carriage running on a common road.

"B. D., of Phila."—A most excellent kiln for drying lumber may be constructed by running good brick flues along both sides of a room, and leading the smoke from the return flue up the chimney. Use a good brick furnace with iron furnace bars. It is best to have a slatted ventilator in some part, so as to open and close it when necessary.

"W. D., of R. I."—We are much obliged to you for the extracts which you sent, one of which, however, has been noticed by our foreign correspondent. Tell your friend that the fees for him are the same as those for a native born citizen.

"A. H., of Pa."—We have received your copies of the chromatype. You must try some other mixtures also, and you may, with your home-made "Camera," get very good pictures.

"J. E., of Ky."—Yours of the 25th inst., enclosing $2, came safe. Your subscription now expires with No. 16, Vol. 8—as the $2 previously sent came to hand. You can address B. Pike & Sons, of this city, in regard to the compass.

"J. A., of Ohio."—The improvement you ask advice upon would not, in our opinion, infringe upon any other now in use. There does not appear to be sufficient novelty to warrant an application for Letters Patent, and we advise you not to apply.

"G. D. J, of Pa."—Your subscription does not expire until No. 52, and we presume your statement to be correct, but do not now remember.

"J. R. S., of Conn."—Mr. Dimpfel uses a peculiar blower to return the smoke in his locomotive boiler. It is said to be useful and economical.

"H. H. O., of Conn."—The mode you speak of to propel steamers by horizontal pumps, forcing the water out of the stern, is old. It has been tried often; it is a wrong principle of propulsion.

"R. V. DeW., of Albany."—Nos. 28 and 31, Vol. 3, cannot be supplied, we regret to say.

"S. G. W., of N. Y."—The specifications, drawings, and assignment have been forwarded to the Patent Office. Will probably hear from your case in 3 months—perhaps earlier.

Money received on account of Patent Office business, since March 5, 1851 :—

L. D. G., of Mass., $30; J. D., of N. J., $25; M. & G., of S. C., $700; E. S., of N. H., $20; W. R. of Mass., $20; W. B. of N. Y., $10; W. & B. D., of Conn., $20; J. W. O., of O., $10, and E. B., of N. Y., $300.

Specifications and drawings belonging to parties with the following initials, have been forwarded to the Patent Office within the past weeks :—

G. B. R., of Conn.; J. G. W., of N. Y.; J. W., of N. Y., L. M. W., of N. Y.; W. R., of Mass.; J. W. O., of O.; I. J., of N. Y.

ADVERTISEMENTS.

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" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

Advertisements should not exceed 16 lines, and cuts cannot be inserted in connection with them at any price.

American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Branches of our Agency have been established in London, under the charge of Messrs. Barlow, Payne & Parken, celebrated Attornies, and Editors of the "Patent Journal;" also in Paris, France, under the charge of M. Gardissal, Editor of the "Brevet d'Invention." We flatter ourselves that the facilities we possess for securing patents in all countries where the right is recognized, are not equalled by any other American house. MUNN & CO.,
128 Fulton street, New York.

VALUABLE PATENT FOR SALE—Embracing Massachusetts (with the exception of two small counties, and a few towns of minor consequence), Connecticut, and Rhode Island, entire. The assignment of Morse's Patent Tan, Sawdust, Peat, and other fine fuel Burner for heat, the cost of such fuel being nothing, together with a complete assortment of patterns, is now offered for sale for a term of about ten years, (patented 1846), on advantageous terms, with a stock of stoves ready for use, with the same if desired. The stoves yield a good profit, many hundred have been and many thousands must be sold.

The assignment belonging to a firm dissolved, must be sold to close the concern. To those persons who are using this patent unlawfully, I say you are known and watched, and will soon be called upon to render an account for such violation. For further particulars inquire of E. F. DIXIE, Worcester, Mass. 24 3*

TO TIN PLATE AND SHEET IRON WORKERS.—ROYS & WILCOX, Mattabesett Works, East Berlin Station, on the Middletown Rail Road, manufacture all kinds of Tools and Machines of the best quality, both in material and workmanship. This establishment being the only one where both tools and machines are manufactured, superior inducements are offered to the trade; all work warranted, with fair use. Agents in most of the principal cities of the United States and Canada. Oiders promptly attended to. F. ROYS,
E. WILCOX.
Berlin, Conn., Nov. 1, 1850. 7 1amly

THE NASHVILLE MANUFACTURING Company (chartered by the State of Tennessee) being now engaged in the erection of extensive machine works, wish to engage the services of a person thoroughly competent to manage the same. It is the intention of the Company to engage extensively in building locomotives, steam engines, &c. None but such as can furnish undoubted testimonials for skill, energy, and other requisites to fill the station, need apply. The Company also wish to employ a number of machinists, founders, &c., and would also receive propositions for the necessary tools, &c., for such an establishment. Immediate application, by letter or personally, to the undersigned, will meet attention.
S. D MORGAN, Prest. Nashville Man. Co.
Nashville, Tenn., Jan 17, 1851. 21 6*

TO LUMBER DEALERS.—Law's Planer having undergone important alterations, is now perfected and in successful daily operation, facing and matching at the same time, and in both respects, in a style not to be surpassed. The common objection that machines are expensive in repairs, is not applicable to these new machines—they are simple, strong, and easily kept in order. It is confidently believed that when they are well known they will have a decided preference over any other machine or mode of planing. Planing of all kinds done at short notice, corner of Water and Jay sts., Brooklyn. Law's Stave Machine dresses and joints staves of all kinds, shapes, and widths, by once passing through. Rights or machines for sale by H. LAW, 216 Pearl street, or after 1st March, at 23 Park Row. 21 8

HUTCHINSON'S PATENT STAVE MACHINE.—C. B. HUTCHINSON & CO., Waterloo, N. Y., offer for sale town, county and State rights, or single machines, with right to use the same. This machine was illustrated in No. 2, Vol. 5, Sci. Am.; it will cut from 1,500 to 2,000 perfect staves per hour. We manufacture machines of different sizes, for keg, firkin, barrel and hogshead staves; also, heading shingle, and listing and jointing machines. These machines may be seen in operation at St. Louis, Mo.; Chicago, Ill.; Savannah, Ga.; Madison, Ia.; Ithaca, N. Y.; Waterloo, N. Y.; Bytown, C. W. Letters directed to us, post-paid, will receive prompt attention. 15 3m*

LEONARD'S MACHINERY DEPOT, 116 Pearl st., N. Y.—The subscriber has removed from 66 Beaver st. to the large store, 116 Pearl st., and is now prepared to offer a great variety of Machinists' Tools, viz., engines and hand lathes, iron planing and vertical drilling machines, cutting engines, slotting machines, universal chucks, &c. Carpenters' Tools—mortising and tennoning machines, wood planing machines, &c. Cotton Gins, hand and power, Carver Washburn & Co.'s Patent. Steam Engines and Boilers, from 5 to 100 horse power. Mill Gearing, wrought iron shafting and castings made to order. Particular attention paid to the packing, shipping, and insurance, when requested, of all machinery ordered through me. P. A. LEONARD.
15 3m

SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., will have finished 2 Power Planers ready to ship by the 1st of Feb., that will plane 9 feet long, 31 inches wide, and 24 inches high, with angle feed; counter shaft, pullies, and hangers, splining and centre heads, with index plate, and weigh over 5,000 lbs.; also 2 power planers that will plane 5 feet long, 22 in. wide, and 20 in. high, with counter shaft, pullies, and hangers, and weigh 2,400 lbs.—These planers are 25 per cent. lower than any others built. Cuts can be had by addressing as above, post paid. 19tf

IRON FOUNDERS MATERIALS—viz., fine ground and Bolted Sea Coal, Charcoal, Lehigh, Soapstone and Black Lead Facings of approved quality. Iron and brass founders' superior Moulding Sand, Fire Clay, Fire Sand, and Kaolin; also best Fire Bricks, plain and arch shaped, for cupolas &c.; all packed in hogsheads, barrels or boxes for exportation, by G. O, ROBERTSON, 4 Liberty Place, near the Post Office, N. Y. 22 3m*

MATAPAN MACHINE WORKS—Corner of Second and A sts., South Boston. The undersigned have recently enlarged their business and are now prepared to offer a great variety of Machinists' Tools, viz., Engine and Hand Lathes, iron Planing and Vertical Drilling Machines, Cutting Engines, Slotting Machines, and Universal Chucks; also Mill Gearing and Wrought Iron Shafting made to order.
22 12* GEO. HEPWORTH & SON.

MACHINES FOR CUTTING SHINGLES AND STAVES.—The undersigned is the owner of the following States of Wood's Improved Shingle Machine, Patented Jan. 8th, 1850, viz., Maine, New Hampshire, Vermont, Delaware, Maryland, Virginia, North and South Carolina, Georgia, Alabama, Florida, Arkansas, New Mexico, California, Oregon, District of Columbia, and one half of Connecticut. The above territory is for sale with or without the machines. No machine ever patented can do the same amount of work in so perfect a manner. Address CHARLES WATERMAN, West Meriden, Ct.
24 4*

NOTICE TO MACHINISTS.—Wanted, immediately, a competent hand as foreman of a machine shop, where the principal work done is building stationary steam engines. An industrious man with steady habits, who can give testimonials of his ability to do, and direct work in such a shop, will be sure of employment at generous prices, if application be made soon. Reference—Wm. Kemble, 79 West st., N. Y. Address E. W. HUDNUTT & CO., Geneseo, Livingston Co. N. Y. ☞ Wanted, 2 or 3 good machinists. 24 4*

PATENT DREDGE BOAT.—The subscriber having obtained a patent for improvements on the Dredge Boat, offers to sell rights to build and to use his Patent Dredge Boat in any part of the United States; the excavating apparatus consists of twenty scoops, preceded by plows receiving great pressure, and are capable of raising eight or ten cubic yards of mud or gravel per minute; the scooping apparatus may be fitted on an old steamboat or other vessel, for the purpose of removing bars or other obstructions to navigation. A working model may be seen by calling on the subscriber. JAMES CALLAGHAN,
20 10* No. 64 Spruce st., New Bedford, Mass.

WILLIAM W. HUBBELL—Attorney and Counsellor at Law, and Solicitor in Equity, Philadelphia, Penn.

PATENT BREAD CUTTER—The subscriber will sell rights for this very valuable article, for a single State or for all the States except Vermont, Maine, Massachusetts, Rhode Island, Connecticut, New York, Missouri, Illinois, and Iowa, on reasonable terms. The Cutter will be wanted in almost every family, and will sell readily at a large profit to the manufacturer. Personal application or by letter, post paid, to the subscriber, at Berlin, Conn., will receive promptattention. FRANKLIN ROYS. 25 4*

DICK'S GREAT POWER PRESS.—The public are hereby informed that the Matteawan Company, having entered into an arrangement with the Patentee for the manufacture of the so-called Dick's Anti-Friction Press, are now prepared to execute orders for the following, to which this power is applicable, viz.—Boiler Punches, Boiler Plate Shears, Saw Gummers, Rail Straighteners, Copying and Sealing Presses, Book and Paper Presses, Embossing Presses, Presses for Baling Cotton and Woollen Goods—Cotton, Hay, Tobacco, and Cider Presses; Flaxseed, Lard, and Sperm Oil Presses; Stump Extractors, &c. &c. The convenience and celerity with which this machine can be operated, is such that on an average, not more than one-fourth the time will be required to do the same work with the same force required by any other machine.
WILLIAM B. LEONARD, Agent,
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MACHINES FOR CUTTING SHINGLES. The extraordinary success of Wood's Patent Shingle Machine, under every circumstance where it has been tried, fully establishes its superiority over any other machine for the purpose ever yet offered to the public. It received the first premium at the last Fair of the American Institute—where its operation was witnessed by hundreds. A few State rights remain unsold. Patented January 8th, 1850,—13 years more to run. Terms made easy to the purchaser. Address, (post-paid) JAMES D. JOHNSON, Redding Ridge, Conn., or Wm. WOOD, Westport, Conn.. All letters will be promptly attended to. 10tf

GURLEY'S IMPROVED SAW GUMMERS —for gumming out and sharpening the teeth of saws can be had on application to G. A. KIRTLAND, 205 South st, N. Y. 10tf

A CARD.—The undersigned begs leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools, also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style, which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools, and manufacturer of Mathematical Instruments, 154 Fulton street. 1 6m*

TO PAINTERS AND OTHERS.—American Anatomic Drier, Electro Chemical graining colors, Electro Negative gold size, and Chemical Oil Stove Polish. The Drier, improves in quality, by age—is adapted to all kinds of paints, and also to Printers' inks and colors. The above articles are compounded upon known chemical laws, and are submitted to the public without further comment. Manufactured and sold wholesale and retail at 114 John st., New York, and Flushing, L. I., N. Y., by
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THOS. PROSSER & SON, Patentees,
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THE SUBSCRIBER is now finishing four 14 horse engines, with boiler and apparatus all complete—price $1200 each. Several 6 horse engines extremely low; also, several of smaller capacity, complete; also, several power planers, now finishing.—Galvanized chain for water elevators, and all fixtures—price low—wholesale and retail. Orders, post-paid, will receive prompt attention. AARON KILBORN.
No. 4 Howard st., New Haven, Conn. 18 10*

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Scientific Museum.

Accidents and Emergencies.

This is the title of a very excellent and cheap little work, by Alfred Smee, F. R. S., and published by Fowlers & Wells, of our city. To show how practical it is, we publish the following extracts from its pages :—

Burns and Scalds.—The action of a hot body on the skin is called a scald, if the hot body be fluid, such as boiling water or melted grease. If the substance be solid, or if the injury arises from the effect of fire, it is called a burn. When the clothes catch fire, roll the person in the carpet, or hearth-rug, or bed blanket as quickly as possible, to stifle the flames, leaving only the head out for breathing

The effects of burns are three-fold—redness and pain, blisters, and total destruction of the part.

Apply cold wet clothes until the heat, redness, and pain abate; then, if the skin is entire, wet a cloth covered with a dry one. If the surface is destroyed, apply linen covered with any bland oil or cerate. If blisters arise, leave them alone, if not very tense; and if they be very tense, puncture with a fine needle, and keep on the lint and oiled silk.

Absence of pain over the injured part is a bad sign, and shows that it is destroyed. Apply linen and oiled silk as before, or a bread-and-water-poultice.

If shock exists, constant care alone will save the patient. Afterward, if excessive sleepiness or stupor, or difficulty of breathing sets in, or great pain ensues about the stomach, danger exists. The surgeon should always attend even the slightest burns, if large in size, for then, especially in children, there is always ground for alarm.

Explosions.—Explosions may produce effects like burns, and the injury requires them to be similarly treated. Explosions may tear, bruise, etc., and Shock must be particularly attended to.

Chemicals.—Various chemicals, such as nitric acid, nitrate of silver, strong sulphuric acid, etc., may destroy some parts of the skin. Cover with linen and oiled silk, or bread-and-water poultice. These injuries generally do well.

Chilblains and Frost Bites.—Excessive cold will act upon the body somewhat like heat and produce redness, blisters, or destroy the part. For chilblains, employ friction, with soap liniment. For frost bites, rub with snow or very cold water, in a cold room, and bring the warmth back very slowly. A sudden application of heat instantly and irrecoverable destroys the part.

Cold Water.—To drink cold water or other fluids after fatigue and abstinence in a heat above 85 degrees, is almost certain death.

Bites of Mad Dogs.—Not one dog-bite in ten thousand comes from an animal which is mad. Where any one is bitten by a dog which is unquestionably mad, take a carving-fork and break off one prong, and heat the other in the hottest part of a common fire. Apply this thoroughly to the whole of the bite, so as to destroy the surrounding parts. If a surgeon be within an half an hour's journey, tie a string tightly above the part and use all possible dispatch to secure his aid. In all suspected cases of madness, keep the dog chained up, for perhaps it may be a false alarm, and the continuance of the dog in health will be a great satisfaction to the party bitten.

Dangers of Camphene.

Under this caption the Boston Transcript of Saturday relates the following distressing incident: An interesting lad eight and a half years old, son of James M. Pettingill, Esq., No. 3 Washington Court, was mortally burnt last night by the breaking of a lamp filled with Porter's fluid. The boy was going up stairs to bed when he accidentally broke the lamp, and the contents were spilled upon his clothes. He tried to extinguish the flames, but not succeeding, ran screaming for help. But he was so badly burnt from head to foot that he died at half past four o'clock this morning.

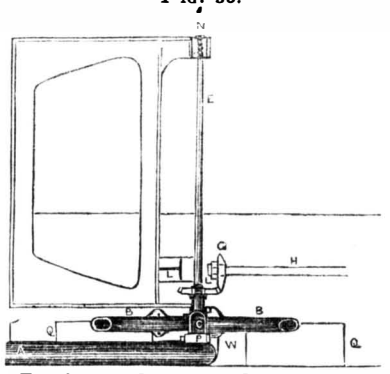
[No family where there are children should allow this fluid to be used in the house. We have distinctly spoken of this more than once and pointed out the dangers of using it. We hope this may meet the eye of some one who is careless of the safety of his family.

For the Scientific American.

Hydraulics.

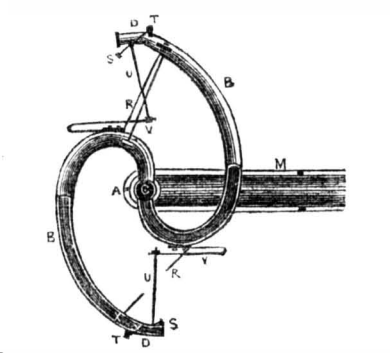
(Continued from page 200.)

Fig. 33.



The Scotch Turbine.—The accompanying engravings represent a water motor named "Whitelaw & Stirrat's Wheel," after its inventors. Figure 33 is a side elevation, and fig. 34 is a plan view, showing the arms and other parts of the machine. A is the main water supply pipe. B B are the arms of the wheel. The water passes into them at the centre part, C, and escapes at the extremity jet pipes, D D. E is the driving shaft; F is a bevel pinion, and G is a bevel wheel to give motion to the shaft, H. I is a large bracket affixed to the wall of the building, this supports the shaft, E, and another bracket, L, carries one end of the shaft, H. N is the bearing of the main shaft; Q Q are openings through which the water escapes under the arms into the tail race. As the main pipe, A, is secured to the building, the water would escape when the wheel is in motion, were it not for a ring round the under side of the aperture, C, and of a cylindrical part, P; this is packed with a leather washer. These parts are ground, packed, and fitted so nicely that the water acts to keep the joint tight, especially as there is a leather at W, inside of the pipe, A, to prevent escape by the pipe and cylindrical part. R R are stay bolts to support the arms; S S are valves, and ST ST are levers which work upon the centres, T T, and form a connection of these with the valves. There is a lever at the top and one at the bottom side of each valve. The rods, U U, form a connection with the levers, and V V are springs fixed to the arms. The end next to the valve of each jet pipe (fig. 34) is a circle drawn from

Fig. 34.



T as a centre, and each valve is curved to fit and work correctly upon the end of its pipe. The levers are adjusted so that the valves will work without rubbing upon the ends of the jet pipes, but it is not essential to have the valves perfectly tight. The machine revolves so fast as to make the united centrifugal forces of the valves, S S, the rods, U U, and the levers and springs greater than the weight which will bend the springs, V V, to the distance shown in fig. 34, the valves will recede from the centre of the machine till the force of the springs gets sufficient to overcome the centrifugal force of the valves; the centrifugal force, therefore, will cause the valves to cover the ends of the jet pipes and allow less water to escape, so as to diminish the water when the wheel goes too fast, acting like a governor upon the throttle valve of the steam engine. This wheel is built upon the principle of Barker's, which, as we have stated before, is the parent of all re-action water-wheels. The arms of this wheel are bent (thus it is different from Barker's) to allow the water to run from the centre to the extremity of the arms when they are in motion, nearly in a straight line. The motion of the centre of the jet pipes is as quick as that of the water which drives the machine. The arms, it will be observed, are contracted towards the ends, and formed in the manner represented at X Y, fig. 34. A number of these machines are in operation in America, and the wheels are manufactured at Cold Spring, N. Y. It is stated that they give out 75 per cent. of the full power of the water. A controversy was carried on a few years ago between Mr. Whitelaw, of Scotland, and Mr. Elwood Morris, of Pennsylvania, respecting re-action water wheels, Mr. Whitelaw taking the ground that, if well constructed, they would give out 75 per cent., and even more, and Mr. Morris taking the ground that they could give out but little, if any, over 50 per cent.

New Mode of Fresco Painting.

The London Athenæum contains an account of a new discovery of fresco painting, lately introduced into Germany and termed Stereochromic.

The discoverer is Prof. von Euchs, of Munich, who, it seems, had to undergo all the opposition and jealousies incident to discoverers in general. Though now, in his old age, his invention is made use of in the new frescoes at Berlin, it is possible that he may die without reaping any personal benefit from it.

Stereo-chromic is a preserver of the wall on which it is painted by the chemical action of the solution sprinkled over the picture while in progress, the whole ground on which it is painted and the picture itself becomes one hard flinty mass, and the colors are converted into the hardest stone. So hard, indeed is it, that neither fire nor damp has the slightest effect on it. The most striking experiments have been made to test it during the last twelve years. The colors are not combined, as in *al fresco*, with lime, but with a solution of silex; and all the advantages of fresco painting are obtained without any of its disadvantages. This species of painting resists every influence of climate, and may be confidently used as an external coating for buildings in any part of the world. To the artist himself it offers the most important recommendations. He is not confined to time in executing it. He can leave off when he pleases, and for any length of time; which he cannot do in fresco work by any means, nor in oil painting within certain limits. The highest advantage of all, however, is, that the same part may be painted over and over as often as you please—which is not possible in fresco; and, consequently, in this new mode the most perfect harmony may be preserved throughout the largest possible painting. In fresco, the artist is the slave of his materials—here, he is their arbitrary master to the fullest extent.

The Florida Reefs.

A correspondent of the Savannah Republican, writing from Key West, says :—

"We were highly entertained last evening with a lecture from Professor Agassiz. He took for his subject the Florida Reef and its builder, the coral insect. He set out with stating his opinion that the peninsula of Florida was made by this little workman, and with illustrations on the black-board, described its physiology. There are, he says, different races of coral insects, some of which lay the foundation of the reef in deep water, build up to a certain height, and die. These are succeeded by another race, who build up another step, and are followed by other races, until the edifice reaches to near the surface of the water, when the little mason is *functus officio*, and leaves his labors to be crowned by other agencies of nature. When this work is done, deposits from the sea are made upon the rock, which finally extend above the surface of the water, and become *terra firma*. He thinks that the peninsula is but an extension of reef after reef, the first being the construction of the coral-insect, then becoming reefs or islands, and the intervals between these being filled up in time by *debris* from the sea, altogether form main land. If this theory be true, we may conclude that the wrecking business will last so long as the coral exist. Light-houses and beacons may warn the mariner from some of the dangers that lie in his path, but he has a little foe who is continually piling up stumbling blocks in his way, and laying snares in the track where he believed all was blue water and security. The Professor will make a report we understand, to the Chief of the Coast Survey, which will interest you as did his lecture of last evening his intelligent audience.

Ohio Wheat.

Three Counties of Ohio—Wayne, Stark, and Ashland—raised over 4,000,000 bushels of wheat last year. Ohio can raise wheat enough to feed all England. This is the land of bread. Oh, why is it, that in any part of the world the poor should mourn for bread when there is enough and to spare raised for all?

New York and Erie Railroad Bonds.

No less than $3,594,000 bonds of this railroad were sold in the Exchange of this city on Thursday of last week, in the short space of 37 minutes.

LITERARY NOTICES.

The Annual of Scientific Discovery, 1851.—We are glad to see this useful yearly collection of facts relating to the progress of science, on our table. It is edited by Dr. Wells, of the Scientific School, Cambridge, and G. Bliss, Jr., and is published by those enterprising publishers of good works, Gould & Lincoln, Boston. This work is a collection of facts from a thousand different sources, about the progress of science in machinery, chemistry, astronomy, geology, &c. It is enriched with a fine steel plate of Prof. Silliman, of New Haven.

Hunt's Merchant's Magazine.—This able Magazine, for March, contains a very able article on the Rise and Price of Silver; the Commerce of France, in 1849; Internal Improvements in the State of New York—and a great number of other articles, characterized by the usual ability displayed in the selection and management of its accomplished editor.

Marine and Naval Architecture: By John W. Griffiths.—This valuable treatise upon ship-building has received the unqualified approbation of the most eminent builders in this and foreign countries. Mr. Aug. Normand, of Havre, one of the most scientific constructors in France, says,—"it is an excellent work, and embraces more substantial information and first principles than any other work published up to the present time." Price of the entire work unbound $9, bound $10. For sale at this office.

Dictionary of Mechanics and Engine Work.—No. 24 of this useful work, by D. Appleton & Co., N. Y., contains articles on Knife Sharpeners, Lamps, Lathes, and the Lead of Slide Valves.

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It also possesses an original feature not found in any other weekly journal in the country, viz., an *Official List of PATENT CLAIMS*, prepared expressly for its columns at the Patent Office,—thus constituting it the "*AMERICAN REPERTORY OF INVENTIONS.*"

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PREMIUM.

Any person sending us three subscribers will be entitled to a copy of the "History of Propellers and Steam Navigation," re-published in book form—having first appeared in a series of articles published in the fifth Volume of the Scientific American. It is one of the most complete works upon the subject ever issued, and contains about ninety engravings—price 75 cents.

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